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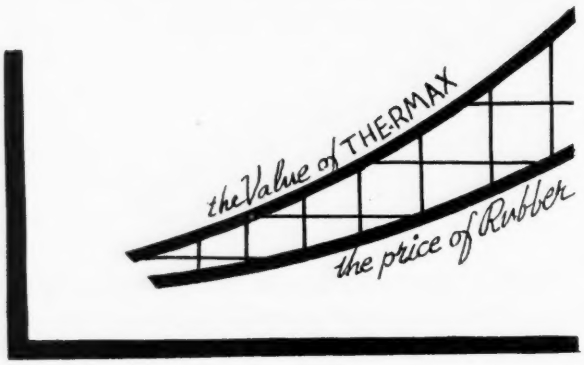

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Tire Makers Have a Good Year

Price Stability Has Benefited Both Manufacturer and Public—Labor Unrest Chief Disturbing Factor—A New Code

Jerome T. Shaw

STABILITY and profit making marked operations in the automobile tire industry during the past year, and both tire manufacturers and retailers look forward to a continuance of the successful performances in 1937. Not in years has the industry been so soundly optimistic about the future.

Adoption of the 1937 industry program on November 2 further strengthened the feeling that the coming year should be a prosperous one. Under the new program consumer prices were raised from 4 to 10% on the first and second lines and dropped slightly on the other lines to permit the latter products of the major companies to be in a better competitive position with tires sold by mail-order and chain organizations.

Blank & Stoller, Inc.

Jerome T. Shaw, Editor of "Tires" Magazine

Dealer discounts were revised so as to allow the retailers to make a larger margin of profit. Adjustment of discounts resulted in a shortening of the profits heretofore allowed jobbers and wholesalers, confirming rumors circulating in the industry for several months to the effect that the major companies would in the future pay more attention to smaller dealer accounts.

Revision of the discounts granted to so-called national and commercial accounts so that under the 1937 program dealers can handle this type of business direct was another indication of the policy of the manufacturers to bolster the profit possibilities of the retailers.

Meetings held by the manufacturers in New York during the week of the automobile show effected a cementing of the determination of the larger factors that the ensuing year would be one in which profits rather than volume would be the main objective.

Like other industries the tire business is still uncertain regarding the effect legislation will have on its operations, but leaders believe that now that it has been demonstrated that price stability is possible in the industry, the problems of the future will revolve chiefly around methods of distribution.

There have been other profitable years, even since 1929, but market stability and the absence of cut-throat competition among manufacturers for any reasonable length of time established a record in 1936. Through the latter part of 1935 and the first ten months of the present year there have been no major disturbances in the merchandising procedure of tire manufacturers and tire dealers.

There have been occasional price flurries and concessions in the way of free tubes and extended guarantees in some quarters, particularly among the chains, but they were ignored by influential factors and, as a consequence, there did not develop the price "wars" that in other years proved so disastrous.

Profits Reflect Peace

That this period of harmony has been productive of beneficial results is indicated by the financial reports of the four leading companies covering operations during the first half of the year. Both net sales and net income jumped materially above the showing during the corresponding period of 1935. Income of these four tire makers reached $11,266,000, a gain of close to 64% over 1935's first half. The sales of one of these companies increased about 70% over the total for the first half of 1932, its low year, and a net profit of $2,187,000 replaced a deficit of $5,028,000 marked against the concern in the 1932 period.

Smaller manufacturers also enjoyed growing sales and profits, though not favored by the marked increase in the sale of tires to car makers for original equipment.

While replacement sales, which indicate dealer business, again failed to come up to expectations, the retail situation as a whole was improved over that existing in 1935. The greater profit per unit helped to offset the failure of replacement sales to advance appreciably in numbers.

See Gain in Volume

Reflecting the upward curve in car manufacture, the tire industry during 1936 is expected to jump its pneumatic tire production record to close to 54,000,000 units, the highest mark since 1930. In 1935 the tire makers of the country turned out 49,500,000 casings and in 1934 the official figures indicated an output of 47,200,000.

Starting with March and continuing up through September, tire shipments kept consistently ahead of production. As a result, the inventory position of the industry at the end of July was at its lowest point since September, 1933, and the fill-in orders of dealers resulting from summer sales had not as yet been recorded.

Based on the official figures for the first eight months of the year, it is estimated that the sale of pneumatic casings will total about 54,880,000 units for 1936, a gain of 10% over 1935 when shipments of all kinds amounted to 50,200,000. The largest increase was naturally scored by original equipment shipments which, based on the results up to August 31, are figured to count for 24,000,000 of the tires sold during the year.

New Cars Vital Market

The influence of new car sales on the business of the tire manufacturers will be appreciated when it is understood that in 1934 original equipment tires amounted to 13,700,000, and with the spurt in automobile sales last year reached to 19,200,000. During the first eight months of 1936 equipment sales increased 26% over the same period of last year.

Using the August figures as a base, and they indicated an increase of but 1% over 1935, sales of tires by retail outlets during the year should amount to nearly 30,000,000. In 1935 they totaled 29,900,000. Export sales showed a decline of 20% at the end of August and for the year are expected to total 888,000, as compared with 1,100,000 in 1935.

While the industry has been free from price wars during the past year, competition has been just as keen as ever among the thirty or so companies engaged in manufacturing activities. In November, 1935, the tire makers endorsed what became known as the industry program, the basis of which was that operations were to be on a profitable scale.

At that time the manufacturers withdrew all the so-called "emergency" discounts extended during the series of price disturbances that marked 1935 operations. Dealer prices were tightened and "cut backs" to retailers were eliminated.

The industry program, reflecting the determination of the manufacturers, as expressed by one prominent executive, to have profits the 1936 objective and to have volume of business subordinated to price, operated effectively through the winter and spring months. In fact, conditions were so satisfactory in all parts of the country that in May dealer discounts were reduced so that in order to obtain the same margin of profit as previously, retailers were forced to advance consumer prices from 5½ to 11%. At the same time quotations to national and commercial accounts were increased, and the wages of factory workers raised 5 to 10%.

Price Structure Holds

It was expected that with the opening of the active driving season the price structure would soften and an outbreak of concessions would occur. But for eleven months stable conditions prevailed throughout the industry.

The mail-order concerns, which for seven years virtually set the pace in the matter of establishing prices, continued to lose ground as factors in the marketing of tires, accounting for much less than the 14.3% of the total replacement business of the industry which they, with chain stores, shared in 1935.

Slack in the mail-order and chain sales was taken up by the number of tires that passed through gasoline stations and the service stations directly operated by tire manufacturers. A break-down of 1935 sales showed that the last two outlets did 19.1% of the replacement business, oil stations being credited with 10.3%.

This shifting of retail tire outlets indicates the inroads made into a business that only ten years ago was controlled almost entirely by independent retailers—individuals who made a specialty of the sale of tires. In 1926, it was estimated, independents did more than 90% of the retail tire business. This percentage was reduced to 73.3 in 1929 and in 1935 was lowered to 57.1, owing chiefly to the development of tire company-owned stores and gasoline stations as tire outlets during the preceding six years.

Tire manufacturers now recognize that distributing methods provide a serious problem for them in the coming year. The Robinson-Patman act already has had its influence on the marketing practices of the industry. Immediately the act became law, Goodyear canceled its much-aired contract to manufacture tires for Sears, Roebuck & Co., which forced the Chicago mail-order house to turn to a group of smaller tire makers to fill its requirements.

Distribution Plan Canceled

A few weeks after this development the contract under which Goodrich made tires for the Atlas Supply Co., for distribution through Standard Oil stations and independent dealers, was abruptly canceled. The explanation was made that it could not be continued because of the Robinson-Patman act, though Atlas tires are still being made, according to latest reports, by another of the larger tire companies. Jobber arrangements and the marketing of other special-brand tires are far from being definitely settled since the Anti-Price-Discrimination Law went into effect.

Independent dealers are strenuously complaining of the competition they meet through retail stores operated by the tire manufacturers. In certain quarters, however, it has been held that the modernly equipped independent, during the past year, has been able successfully to meet company-owned store competition, owing to the absence

THE affable "Jerry" Shaw, editor of "Tires" magazine, has a background of 25 years of continuous activity in automotive and tire manufacturing and merchandising circles. He has a thorough understanding of the whole gamut of policies and practices, good and bad, which have influenced the years of chaotic history of the tire industry, which in turn has largely dominated and determined that of the rubber industry as a whole. His summarization of the many important factors that have been alining and combining themselves in the direction of common good is reprinted here from *The New York Times*, November 8. This article is regarded as significant in that it reveals an unusual sustained period of stability. Let us hope that it will prove the turning point of the entire rubber industry to an era of understanding and prosperity such as this essential industry deserves. "Tires" magazine is also published by Bill Brothers Publishing Corp. (EDITOR'S NOTE.)

of price disturbances, which heretofore have worked to the advantage of the manufacturers' own retail stations.

Some manufacturers predict the return of the independent to a dominant place in the tire merchandising picture, recovering much of the ground he lost to chains and company-owned stations. Excessive overheads in the case of manufacturer outlets and legislation covering chain operations are the reasons given for the optimistic outlook on the future of the independent.

The Independent Dealer

That the independent is not satisfied with his position was indicated by the National Association of Independent Tire Dealers sponsoring a fair-trade practice rules conference, under the auspices of the Federal Trade Commission. The conference, held in June, developed a set of rules, most of which were covered by the Robinson-Patman act, which was approved by the commission October 17. These rules cover price discrimination, defamation of competitors, selling below cost, misleading advertising, and other trade practices which the dealers held were detrimental to their successful operation.

Harmonious merchandising conditions have in a large measure been overbalanced by the industry's labor problem. Manufacturers, particularly those in the Akron district, have been handicapped during the year by a series of labor disturbances which became so serious that decentralization of the industry has been recommended and, in a measure, is being effected.

The uncertainty of tire production in the "Rubber City" caused concern in car manufacturing circles and, unofficially, was given as the reason for the report that the Ford company planned to establish its own tire manufacturing plant. It also was responsible for one tire maker preparing to open a plant in another section of the country and for two additional companies announcing that they contemplated moving some of their tire production out of Akron.

Manufacturing Costs Up

Tire manufacturing costs are much above those of last year, factory wages and raw material prices having moved upward appreciably, but discounting the price wars of recent years, car owners pay no more for their tires. In keeping with the change in automobile design, tire engineers have greatly improved the serviceability of the modern tire. Safety and comfort have been the chief objectives in mind in the development of changes in tire design and construction in recent years, and this has been particularly true within the past year.

As was the case in 1935, crude rubber provided no problem for the manufacturers during the past year, although current prices are about 3¢ a pound above those prevailing at the beginning of the year. Rubber manufacturers are believed to have consumed any stocks they held early in the year costing below the 10¢-a-pound mark and to be now using material that cost them close to the current price.

Stocks of crude rubber on hand in the United States at the end of the half year were considerably below those of the 1935 period.

Rubber Seed[1]

SOME interest has been shown from time to time by Netherland Indian agricultural authorities and planters in the possibilities of rubber seed as a profitable by-product of the most important product in Netherland India. At the same time not only is there a complete lack of reports concerning production of this seed, but little information is available concerning the experiments which have been made with the seed. Export statistics show no exports, but exporters say that occasional small shipments are made.

That the seed of the rubber tree falls to the ground when ripe and that harvesting consists only in gathering the fallen seeds has, of course, always been a matter of general knowledge. Nevertheless the great importance of rubber itself assumed ever since the beginning of its cultivation on a systematic scale overshadowed any possibilities which the seed might have had, according to the few who have ever discussed the rubber seed question. The most complete discussion that appears available is in K. Heyne's survey of Netherland Indian plants, published in 1917, which contains, after a discussion of rubber a paragraph on the rubber seed, of which the following is a summarized translation:

"It (the rubber seed) contains a light-yellow oil . . . the number of seeds necessary to produce one ton of rubber-seed oil amounts to between 500,000 and 1,000,000, while between 400 and 850 seeds can be obtained from each rubber tree. The seeds consist of 51% shell and 49% kernel. The shells are worthless, except as a fuel, but the kernels contain a good percentage of oil. The recent experiment showed that the first pressing resulted in an oil yield of 22.5% of the weight of the kernel, the second pressing gave an 8.5% oil yield, and the third

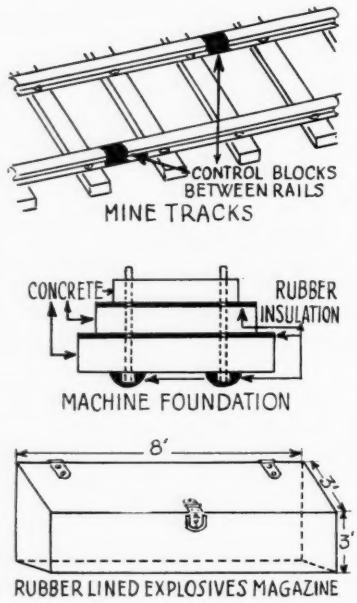
(*Continued on page* 45)

[1] From U. S. Department of Commerce report of Edward A. Dow, Jr., clerk to trade commissioner, Batavia.

Controlling Mine Blasts with Rubber

F. R. Cozzens

PREMATURE blast, that major menace to life and property, is now being conquered in Ohio coal mines by means of rubber. Mines in the Ohio soft-coal belt range in type from the hillside tunnel to the standard cage-shaft, and practically every type is subject to stray electrical currents which filter through the earth from power lines, motors, tracks, and other operating equipment. Under certain conditions these stray currents make coal shooting a dangerous practice, owing to the fact that the currents are often of voltage sufficient to fire charges prematurely. In many cases, explosives cannot be stored in a mine because of currents, and in certain other mines electrically fired explosives such as dynamite and gelatin cannot be used. As mining equipment must be utilized in various ways under electrical power, stray currents cannot be entirely prevented. Safety measures depend upon insulation, and the only insulation material that meets radical underground requirements is rubber.



Rubber as a current breaker was first introduced into the Ohio coal fields in 1910 by a miner named Martin. The mine was of the common hillside type, and after having some painful experience in premature blasts Martin discovered that stray currents were being conveyed over the car track. Being something of an electrician, he experimented with various types of breakers and finally solved the problem by placing blocks, cut from an auto tire, between the joints in the track rails. The experiment was tried and adopted by owners of neighboring mines. The crude breakers were improved upon until breaker blocks were manufactured commercially, and a recent survey shows that more than twenty rubber products and rubberized materials are now being used in current-control in Ohio mines.

To protect a mine from stray currents the modern operator seeks primarily to keep these currents from passing into the earth. Stationary machinery foundations are built with a layer of rubber sheeting, pressed between layers of concrete, and anchor bolts are seated in rubber blocks at the base. Portable engines are protected by nailing two-inch rubber blocks underneath the skids. Dry-ground protection is also obtained by placing several layers of rubberized roofing beneath the anchor plates. Motors and all types of generating equipment must be kept dry, and all wires are insulated or heavily taped.

As electric current must often be conveyed into a mine, special attention is given to the conducting system. Underground wires are subject to temperature extremes, water, dust, oil, etc., and ordinary insulation is not sufficient protection for the modern operator. Where wires must pass through water or along wet timbers, they are given an extra coating of rubberized tape. Rubber blocks are also used in connection with all porcelain or glass insulators.

As a conveyer of stray current, the car track is perhaps the most common medium, but protective measures are more easily applied. This is usually done by fitting blocks of solid rubber, one inch by four inches, between the joints of the rails. The blocks are spaced at 50-foot intervals. Hoisting equipment is cushioned in rubber at all points where it is able to come in contact with live wires.

Many operators now insist that all explosives be carried in boxes wrapped in rubber sheeting, or paper of rubber-asbestos composition. Blasting caps, primers, etc., when not in actual use, must be placed in rubber mats, and during the loading of a charge the operator wears rubber boots or shoes. A further requirement is that all wires connected with an explosive charge be coated with a rubberized covering.

Through these and minor safeguards accident and property loss through stray electric currents has been reduced from 70 to 90% in many coal mines. Since rubber far outlasts temporary insulators such as glass, porcelain, wood, etc., operating costs are lowered, and because of its simplicity rubber protection can be applied to the average mine without the aid of an expert.

Collastics

THE followng quotation from a letter addressed to the editor of *Chemistry and Industry* (London), October 23, 1936, contains a statement that "Collastics" be adopted as a descriptive term for "synthetic rubber."

Chemists have learned that sharp demarcations between classes of substances are not possible. These synthetic elastic materials mark the disappearance of yet another hiatus, for they occupy the no-man's-land hitherto existing between rubber and materials definitely included within the scope of the plastics industry. If a new term is to be applied to these materials, let us have something which tells their story. Dr. Stevens's suggestion, "synthetic elastics," is too long and unwieldy to become popular. I would suggest the description "collastics," which connotes the development of elastic products from colloids. Harry Barron.

How Soviet Rubber Industry Solves Its Problems

Lucien Zacharoff

COMMISSAR FOR HEAVY INDUSTRY ORDJONIKIDZE never tires of emphasizing that complete mastery of the processes of production of synthetic rubber is one of the basic tasks of the industry. Another all-important assignment of the rubber industry —stressed by Ordjonikidze repeatedly in his impassioned speeches at various conferences—is "the struggle for quality."

In a recent comment on the first-named problem the chief of administration of the Soviet rubber factories, O. Osipoff-Schmidt, admitted that it is "not yet fulfilled." In this connection, of special interest are the discussions on the subject held by the outstanding workers in the industry, the Stakhanovites, or those who through superior rationalization improve the quantity and quality of their output. One such worker, a woman named S. Rostokina, employed at the great Moscow plant "Kauchuk," after noting some progress achieved by herself and her fellow workers, declares:

"Does that mean that everything is well at the plant? To be sure, the proportion of consumption of natural rubber is falling. But this is not enough. I shall speak directly: The assimilation and taking root of synthetic rubber production at our factory is proceeding at insufficient tempos and lacks system. While much depends on the Stakhanovite workers, those in charge, the engineers and laboratory experts, must assume the leading role.

"Consider for instance the preparation of formulas. This is a most important business. In a very recent past our laboratory used to prepare them promptly for various products, and our Stakhanovite workers would assimilate them successfully, though not always without difficulties. But of late the preparation of formulas has for some reason slowed down. Why—I don't know for the laboratory does not always acquaint Stakhanovites with the plans for its work or with the process of preparing the formulas. In general, I must note that the laboratory is poorly linked with the Stakhanovites of my sections."

Miss Rostokina goes on to tell that the formulas are issued seldom; hence the output of synthetic rubber products is slowed down while consumption of natural rubber is being reduced to a negligible extent.

Nor is the quality of synthetic rubber at the "Kauchuk" plant sufficiently high. The principal defect is that the rubber is not of uniform composition and is not well worked over. Much gravel is present, which causes protuberances and rough surfaces in the finished products. Such features are especially undesirable in the manufacture of flex and rubber piping.

The same worker, who has been with the "Kauchuk" 11 years, throws additional light on the problem:

"I work at products made exclusively of synthetic rubber. My job is to make the semi-rigid piping for the isolation of electric wires, and we have been transferred to exclusively synthetic basis. I work on great speeds. Before the norm for two constituted 634 kilograms. Now, working alone on the same machine, I produce 1,060 kilograms. Those working next to me have also passed on to higher speeds. I am earning 430 rubles a month. I live rather prosperously, and have recently adopted an 11-year-old girl, as I have no children of my own."

On a different occasion, writing about the same problem that Miss Rostokina touches upon, Mr. Osipoff-Schmidt, after acknowledging some qualitative progress, warned against being too well satisfied with it and called for further advances. In his opinion the factories administered by him must be supplied with synthetic rubber superior to the natural. It must be, the chief insisted, of uniform flexibility and possess better mechanical and chemical characteristics of resistance, must be less subject to aging, and lastly must be very heat resistant. It must be differentiated as to kinds, he further declared, with strict observance of precise specifications. Only thus will the raw material be of the greatest usefulness.

Turning to automobile tires, rubber shoes, and other articles of wide consumption, the administrator, writing in *Za Industrializatziu,* the organ of the Commissariat for Heavy Industry, notes that even here the mastery of synthetic processes is slow.

He compliments as especially advanced the "Krasny Treugolnik" plant, "and yet the preparation of synthetic rubber in the general consumption at this plant last year composed only 21%; in January of this year—23%; in February—31%; in March—33%. For the second quarter of this year they had made plans of 37% synthetic products in the total output."

Only after Ordjonikidze had intervened personally were the percentages for various products at the factory stepped up to 70, 72, and in some instances 100%, so that the average became about 60%. At other factories, Mr. Osipoff-Schmidt tells us, the situation is much sadder.

The administrator deplores the fact that many factories follow the lines of least resistance by working with mixtures of both natural and synthetic rubber. This method, he thinks, does not bring nearer, but on the contrary pushes farther into the future the assimilation of Soviet synthetic rubber processes. For precise formulas are impossible; the quality of the finished products fluctuates; while the valuable characteristics of both kinds of rubber are impaired by mixing. He cites examples of this from the experience of the "Krasny Treugolnik."

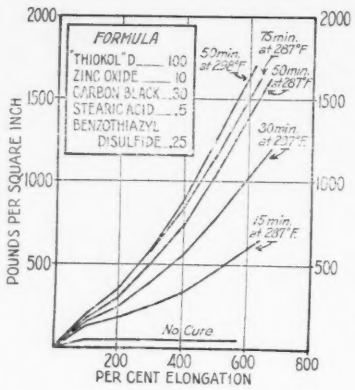
(*Continued on page* 42)

Manufacture of "Thiokol"[1]

T. F. Harragan[2]

DURING recent months there have been many discussions in English and American rubber journals on the likeness and unlikeness of synthetic rubber and natural rubber. Considering these discussions as evidence of a healthful interest and considering widely varying recent applications of synthetic rubber, the case history of "Thiokol" is particularly apt.

The first commercially successful synthetic rubber to appear on the American market was an ethylene polysulphide polymer designated by the letter "A." This product had many shortcomings: it had a penetrating odor; it was not nearly so good as natural rubber at high temperatures, or was it suitable for use at temperatures below zero Fahrenheit. Its physical tests were not high; tensiles of about 900 pounds per square inch were about its maximum. However it had absolutely unique resistance to all classes of solvents and it was cheap. It was, furthermore, completely unaffected by sunlight even on several years' exposure and would withstand ozone without cracking. Finally, its water absorption was only a very small fraction of that of the best rubber compound. Such was "Thiokol" in 1931—several years after Dr. J. C. Patrick had discovered it in a Kansas City laboratory.



The Stress and Strain Data for a Typical Mix of "Thiokol," Both in the Unvulcanized State and after Vulcanizing, Is Shown Here for Varying Lengths of Time and at Different Temperatures

How intensely industry desired a solvent-proof synthetic rubber was evidenced by the welcome it gave the new material, and in its ready acceptance, subsequently, of the many improvements made by the makers. Principal present-day users of "Thiokol" are the automobile, aviation, electric wire and cable, the oil and printing industries.

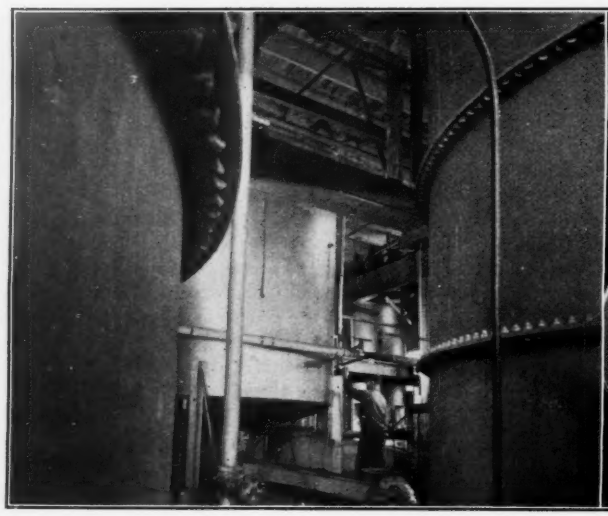
Strategic Material

Quite apart from the benefits of oil-proof synthetic rubber to industry as such, the measure of security "Thiokol" has given the United States is no small item. A nation self-sufficient in raw materials is in the best position for peacetime prosperity and wartime security. In this respect the United States is in a vulnerable position with regard to that very important raw material, rubber.

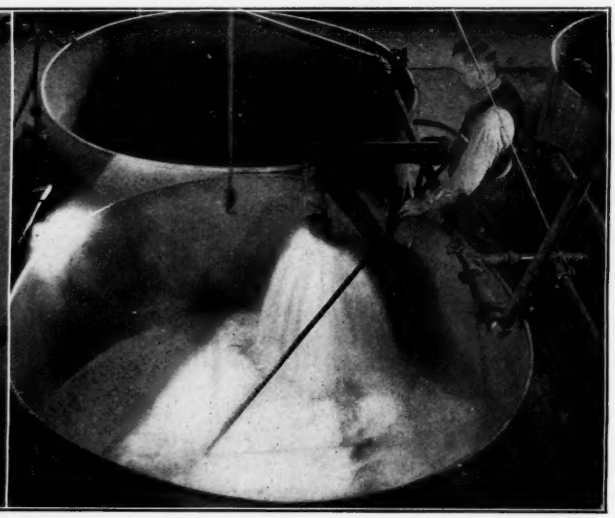
That fact set next to the European dispatches we are reading these days has provoked serious thought in quarters, both official and unofficial, as to whether the present crises in European countries could possibly affect our rubber imports. As strategic materials, synthetic rubbers now quickly producible in this country, have been frequently referred to as important allies in case of such an event.

The production of "Thiokol" depends upon the discovery that certain organic dihalides react readily with inorganic polysulphides to form, in general, high molecular weight compounds. This reaction involves the interaction of bi-functional molecules to give chain polymers, which

[1] Registered trade mark.
[2] Of T. J. Malone, Jr., Inc., New York.



The Large Storage Tanks of Ethylene Dichloride and Sodium Polysulphide at the Plant of the Thiokol Corp., Yardville, N. J., from Which the Liquids Are Carried, by Gravity Feed, to the Mixing Vats



Forming "Thiokol" Is Accomplished by Mixing Ethylene Dichloride and Sodium Polysulphide in Large Vats, Where Mixture Is Effected by Their Own Interaction and by Constant External Agitation for Five Hours

After Five to Six Hours of Mixing, "Thiokol" Settles to the Bottom of the Vat, Permitting Workmen to Cut and Lift Out the Coagulated Material

In This Milling Operation Synthetic Rubber Is Refined and Formed into Sheets Similar in Appearance to Sheets of Crude Natural Rubber

are high molecular weight compounds with definitely rubber-like characteristics.

As first prepared, these polymers are plastic and can be worked on a rubber mill in the same manner that rubber is masticated. By this operation it is possible to incorporate into them reenforcing pigments and other modifying agents.

When this plastic mass is intimately mixed with zinc oxide and heated to about 140° C. (284° F.), a phenomenon occurs that is similar to the vulcanization of natural rubber, and the mix becomes tough and elastic. In this instance the zinc oxide is the vulcanizing agent. As in the case of rubber, this effect is greatly influenced by suitable reenforcing pigments.

The accompanying chart gives the stress-strain data for a typical mix both in the unvulcanized state and after vulcanizing for varying lengths of time and at different temperatures. The vulcanized stock, when stretched and the strain released, retracts with a snap comparable to natural rubber. Alternate stretching and retracting is accompanied by the Joule effect.

As a class, these polymers possess excellent aging characteristics and are relatively inert to a large variety of organic solvents. As to solvent resistance, the materials vary somewhat among themselves. Compounds prepared from the ethylene polysulphide are exceedingly resistant to practically all organic solvents. Those prepared from certain other hydrocarbon polysulphides are resistant to the action of petroleum hydrocarbons, but will swell to varying degrees in certain chlorinated and aromatic hydrocarbons.

The properties of these polymers are such that several of them, under the registered trade mark of "Thiokol," have attained a place of importance as valuable industrial raw materials. They are used in the fabrication of articles requiring flexibility and elasticity at temperatures as low as 40° C. (40° F.) below zero, coupled with solvent resistance or good aging characteristics, or both. In one class may be listed such articles as gasoline and paint spray hose, printers' blankets, and rubber printing plates. In the class where good aging is required, but not necessarily resistance to solvents, may be listed such articles as electric cable coverings, both for overhead and underground installations. In this instance certain of these polymers are

Raw "Thiokol" Ready for Shipment; in Addition to This Form "Thiokol" Is Also Supplied as a Molding Powder and as a Liquid Coating Material

After Two Years of Constant Service This Eight-Inch "Thiokol"-lined Suction and Discharge Hose Is Still in Perfect Condition on the Inside

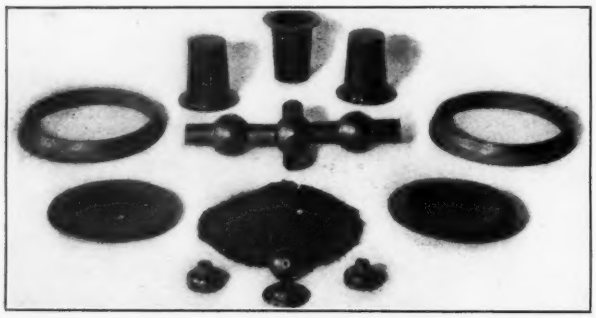
replacing lead sheath as the cable covering, thus effecting a tremendous reduction in the weight of the cable.

The reaction between ethylene dichloride and sodium polysulphide is very simple. When a solution of sodium polysulphide, Na_2S_4, containing a suitable dispersing agent such as magnesium hydroxide, is added slowly and with suitable agitation to 98% of its equivalent weight of ethylene dichloride, a chemical reaction occurs, which increases in rapidity with its own evolution of heat. The temperature must be controlled by the rate at which the ethylene dichloride is added or by suitable cooling.

Manufacture

An interesting point concerning the commercial production of these synthetic materials is the simplicity of operations. From large storage tanks of ethylene dichloride and sodium polysulphide several hundred gallons of each liquid are led, by gravity feed, into mixing vats. At the end of five hours the two chemicals are thoroughly mixed, both by their own interaction and by constant external agitation, forming a latex-like suspension of the polymer, which settles slowly and can be washed free of the excess polysulphide and sodium chloride with water by repeated flushing and decantation. Acid is then introduced into the washed deposit, causing it to coagulate into a rubbery mass. As carried on at the "Thiokol" plant, a layer of "Thiokol" 18 inches in depth and eight feet in diameter is obtained from a single vat.

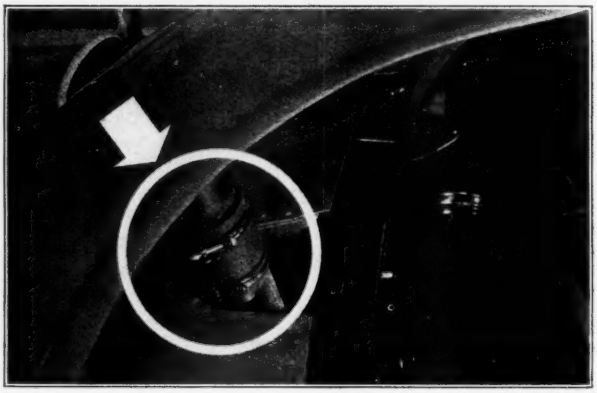
Workmen cut up this rubbery layer, and it is carried to the milling room where a cracker mill removes the gross moisture and shreds the material. A second mill further refines the material and forms it into sheets similar in appearance to sheets of crude natural rubber. The "Thiokol" is then talced and shipped.



"Thiokol" Molding Powder and Some of the Gaskets, Washers, Hose Connections, Etc., into Which It Is Formed

Combination Halftone and Line Cut of Synthetic Rubber for a Rotary Press—Notice the Sharp Detail of the Plate and of the Printing Which Is on Newspaper Stock

"Thiokol"-sheathed Cable Being Installed by the Westchester Lighting Co. to Provide Secondary Cable Network for Mt. Vernon, N. Y., 1933



Flexible, Oil-proof "Thiokol" Is Used Here for the Gasoline Filler Neck Hose on a Chrysler Motor Car

All types of "Thiokol" are processed in this manner, but there are further variations of the manufacturing details, depending upon the form in which each individual material is to be used. Thus molding powder is pulverized from the crude sheet and later vulcanized before it leaves the plant. Coating materials, which are in a liquid state, are first compounded; then ethylene dichloride is used to disperse the compounded sheet material back into liquid form. In the main, however, "Thiokol" is usually supplied in crude sheet to rubber companies who process it. This processing differs in detail but not in principle from the ordinary rubber manufacturing procedure—that is, it is compounded, milled, tubed, and vulcanized.

Leading Applications

Because oil has none of the disastrous effects on this synthetic that it has on rubber, the oil industry is one of the largest users of the new synthetic product. Since it came on the market, oil companies have equipped service stations with hose lined with "Thiokol," placed similar ones on fuel oil tanks, also suction and discharge hose for tank steamers. One of the most novel purposes for which it is being employed by the oil industry is to seal the floating roofs of petroleum and gasoline storage tanks.

The artificial gas industry has found that "Thiokol" gives perfect protection to the tips of gaskets that are subject to deterioration by the solvent action of the gas condensates.

The electric wire and cable industry finds in this material a far superior substitute for the lead sheathing of

(*Continued on page* 47)

The Adequacy of the International Rubber Regulating Agreement[1]

F. Howard Croninger, Jr.

WITHOUT considering the desirability or the undesirability of restriction schemes as such and assuming that restriction was necessary from the producers' point of view, to prevent complete disorganization in the industry, I propose to consider what qualifications the present agreement has for fulfilling the hopes of the rubber producers and meeting the problems of restriction without going to such extremes as will substantially harm the consumer and defeat, over a period of time, the ends desired by its sponsors.

The most obvious starting point for evaluating the adequacy of the present scheme is by comparing it with the ill-fated Stevenson plan. I have enumerated below five major improvements in the 1934 agreement: greater inclusiveness, greater elasticity, control of new plantings, no apparent unwritten understandings, and cooperation with consumers.

(1) The Stevenson plan embraced the British Empire only, including thereby approximately 68.5% of the world's total rubber production in 1922 and but 53.2% in 1927. By contrast the 1934 agreement is one of the most complete international raw material agreements ever signed. In May, 1934, the signatory countries produced more than 98% of the total world production. This has declined to a little less than 98% at the present time (July, 1936), but there is no doubt but that the 1934 agreement has jurisdiction over sufficient rubber production to make it effective, provided internal administration is successful.

(2) The Stevenson plan utilized a pivotal price; whereas the present agreement has an arbitrary control through the International Rubber Regulation Committee, which is allowed very wide discretionary powers. Arguments on the relative merits of these two methods are present in discussions of almost every restriction scheme. For the pivotal price it is said that it provides certainty, eliminates politics, and prevents manipulation. For arbitrary control the argument is that it can operate more rapidly and with greater regard for future developments and that it is better able to cope with emergencies. There is a further argument of a negative character: namely, that a pivotal price mechanism cannot be made satisfactory.

In an industry such as rubber, in which the problem of balancing demand and supply is so very difficult and in which long-run considerations are so important, the arguments seem definitely to favor arbitrary control. Simple arithmetic should have demonstrated to the Stevenson committee that under conditions of increasing demand their plan would be sadly deficient and tardy. It may be true that mechanical control, by means of a pivotal price, is better provided elasticity is secured; but it is practically impossible to attain this elasticity. In addition there is always the problem of what shall be the pivotal price. Costs vary with the amount of restriction, with methods of production, with the price of foodstuffs for laborers, and with general business conditions, so that a fair price is very difficult of precise determination. A "fair" price from the producers' point of view always tends to be one that is just a little higher than the existing price. Under the present plan the main responsibility for the success or failure of regulation lies with the International Rubber Regulation Committee and with its ability to forecast future developments and act accordingly. It may make mistakes, but it can certainly evaluate the future better than any pivotal price scheme could. Further, it is in a position to make judicious experiments in view of the fact that mistakes can be quickly rectified. So far it has operated with great dexterity and ability. It is probably true that because of the pressure of circumstances the committee had no other course open to itself and that the real test will come when stocks are reduced to a point where it can "squeeze" if it so desires. Will it encourage an unfairly high price as the tin control administration apparently has? There are hopeful signs that it will not. The rubber producing industry has learned many lessons in recent years, and it can be reasonably expected that the committee will profit some thereby.

(3) While the Stevenson plan controlled exportation, it left planting and replanting to increase practically at will, with the well-known result that planting jumped tremendously, creating many of the problems which face the industry today. If the present scheme can maintain control through 1938, the condition of great potential over-production will undoubtedly be greatly alleviated because of the control of new plantings, replantings, and exports of planting materials.

(4) Much ill feeling was generated between American manufacturers and British producers during the middle Twenties over "understandings" which the British were supposed to have given the Americans concerning price policy, i.e., that the price would not be allowed to increase beyond a certain point. There is no adequate proof of this accusation against the British, but there was considerable agitation, just before the present agreement, that

[1] These observations are taken from the two concluding sections of an extensive paper dealing with the background, history, and problems of the 1934 International Rubber Regulating Agreement, signed May 7, 1934, by the governments of the United Kingdom, the Netherlands, France, India, and Siam. This treaty merely amplified a producers' agreement entered into on April 28, 1934, by rubber producing associations of the above-mentioned countries. The agreement applies to: British Malaya, Netherland India, Ceylon, India and Burma, French Indo-China, the State of North Borneo, Sarawak, and Siam. Former articles appearing in INDIA RUBBER WORLD have given the text of the producers' agreement (June 1, 1934, pp. 31-33) and have discussed the background and negotiations leading up to restriction (Sept. 1, 1935, pp. 39-41; Oct. 1, 1935, pp. 37-38).

everything should be included within the scope of whatever agreement would be signed.

(5) A further guarantee of cooperation between rubber producers and consumers is the provision for the manufacturers' advisory panel to the International Rubber Regulation Committee. This panel is made up of three representatives, one each from the leading American, British, and Dutch rubber manufacturing associations.

Besides these improvements is the following favorable consideration: the duration of the treaty is of sufficient length to provide a fair test. By the end of 1938 the Dutch will know whether they can control the natives. And, more important, the statistical history of the agreement will show whether or not a measure of stability can be attained through control of exports, reduction of stocks, prohibition of new planting, and stringent administration.

Also, at present, business conditions are definitely favorable. Rubber consumption has increased ever since regulation began and gives every promise of enlarging further. The American automobile industry is moving upward, and as the auto industry goes, so, in large measure, goes rubber production.

Other uses for rubber are also expanding although as Holt and Lockwood say:[2] "Whatever opposing rubber interests may think of restriction, they are agreed on this point, that the future prospect of the industry depends on discovering and creating new uses for rubber."

Or Seybold:[3] "What is most needed is a means of consuming 500,000 tons more of rubber annually."

For such reasons as these the inclusion in the agreement of a provision for levying a small tax to finance research and experimentation toward developing new uses for rubber is of significance.

Therefore, in view of the above discussions, the agreement itself seems sound; everything depends upon its internal administration. All that can be said on this point now is that the two principal governments, Great Britain and the Netherlands, seem determined to follow it through to the best of their ability. Throughout the period of negotiations, 1929-34, it was apparent that neither government was going to accept restriction unless it was satisfied that such restriction could be made to work. Immediately after signing, each country enacted legislation designed adequately to enforce the provisions of the treaty. Quite naturally, of course, difficulties and injustices have arisen, but both governments have been alert to try to meet emergencies such as the holding up of stocks by some Malayan planters in an effort to bring further price rises, and excess native exports. This "will to enforce," while difficult closely to define or locate, is one of the outstanding strengths of the scheme.

With all these conditions in its favor what can stop the success of restriction? Either of two possible situations can bring disaster. (1) If the International Rubber Regulation Committee fails to exercise good judgment and follows an intemperate policy, restriction will fail. This committee has very wide discretionary powers and is thus subject to the dangers of arbitrary control. If it becomes determined to operate the scheme for the short-run advantage of the rubber producer, nothing will save the plan—nothing, with the possible exception of strong governmental pressure. (2) If the natives of the Dutch East Indies prove so unmanageable that further repression would lead to such discontent and trouble that the Netherlands Government would be unwilling to endure it and would relax its vigilance, then the plan will fail. These two aspects are related by reason of the fact that a major consideration which might make the natives unmanageable would be higher rubber prices resulting from intemperately increased restriction by the International Rubber Regulation Committee. (*To be continued*)

[2] E. G. Holt and W. S. Lockwood, "Rubber Control Scheme at Work," *Asia*, July, 1935, p. 427.
[3] *Barron's*, Jan. 13, 1936, p. 19.

Soviet Rubber Industry

(*Continued from page 37*)

Turning to vulcanization which "decides the quality of rubber products," Mr. Osipoff-Schmidt declares:

"A most important condition of correct vulcanization is the steady optimum temperature regimen. However, altogether different temperatures are required for the vulcanization of synthetic and natural rubber. Consequently, the vulcanization of mixtures has unfavorable effect on the quality of the output. It is not to be doubted that the giving up of the mixing practice and transfer to pure synthetic rubber would lead to appreciable simplification and improvement of production processes and the heightening of quality in the products.

"The 'Krasny Treugolnik' and following it the Yaroslavl rubber-asbestos combine had already passed to 100% application of synthetic rubber in the manufacture of automobile tires. At both factories the tires have become sturdier and otherwise improved. According to the chief engineer of the 'Krasny Treugolnik,' not a single complaint about the quality of the tires has to date come to them. The workers of the factory are now insisting on 100% synthetic production of aviation tires."

The "Krasny Treugolnik" plant is of strategic importance in the Soviet industry. Its daily output of rubber shoes runs into many tens of thousands of pairs. These are manufactured out of a 50-50 mixture. Several years ago, seeking to liquidate completely damaged output, a group of rubber engineers proposed to stamp shoes wholly out of synthetic rubber. Mr. Osipoff-Schmidt deplores the fact that as yet thousands of workers at this factory are using the old hand method, and only 1% of rubber shoes are turned out by the stamping process.

He invited our attention to the Czechoslovakian concern Bata which manufactures footwear from synthetic-rubber suede that not only does not yield to real leather shoes but, in his opinion, substantially surpasses the latter in lightness, elegance, and sturdiness, and at the same time is inexpensive. At the "Skorochod" plant a formula has been evolved for producing such suede from Soviet synthetic rubber. The method allows in the presence of either leather or synthetic-rubber suede tops to vulcanize the soles directly on the shoes, which makes possible a very substantial reduction in the weight and thickness of soles. The sole becomes endowed with small-sized pores, accessible to the air and much sturdier than that of leather.

Other items for broad consumption as well as for industrial purposes can be made of spongy, porous, suede, and other forms of synthetic rubber as well as from the natural.

Administrator Osipoff-Schmidt concludes that despite the great possibilities before it as well as some significant achievements, the industry has been listless on the synthetic front, and now that tempestuous expansion is taking place in the industry, it is proving itself to be unprepared both technically and technologically. He also deplores failure to train adequate personnel for competent work with synthetic rubber. He calls for fruitful collaboration of both branches of the rubber industry, recently admonished by Commissar Ordjonikidze to dispose of its growing pains by the end of 1936.

Commercial Application of Chloroprene and Butadiene Rubber[1]

V. A. Cosler[2]

INDUSTRIAL technology has been a subject very much in the limelight since the early days of the depression, and in recent months considerable interest has been displayed in the effect of different political systems on technological advancement. National economic planning is an essential part of the program adopted by certain recently revived political systems, and many advantages have been claimed by the proponents of these programs. One of the claims made is that economic planning programs adopted by European governments are stimulating the development of new ideas and new materials to a much greater extent than can be done under the capitalistic or competitive economy to which we are accustomed.

It is not our purpose to advance arguments for or against this belief, but it may prove interesting to compare the progress of commercializing butadiene and chloroprene rubber in Germany and Russia and in the United States.

Because of the political situation in these European countries it is quite difficult to secure accurate information as to the details of progress being made in the commercial use of these synthesized materials, but enough information is available to indicate the class of goods being made from them and the purpose behind the emphasis on these products. What is known of the development of industrial uses for butadiene and chloroprene rubbers abroad will be presented first, followed by a more detailed description of the progress of adapting "DuPrene"[3] to the uses of industry under the system of free markets and competitive economy.

At the beginning of this century it was discovered that certain homologs of isoprene undergo polymerization to rubber-like products. This discovery aroused the interest of a number of capable scientists in England and Germany and started research on the problem of synthesizing rubber. At first this problem was chiefly one of academic interest, but with the increasing use of rubber—and particularly the commercial development of the automobile—it assumed a role of practical importance. It seemed probable that a synthetic product could eventually be produced at a competitive price to augment what then appeared to be a limited supply of the natural product. The urgency for this development became less important when it was found that rubber trees could be cultivated and made to produce successfully and economically in the Far East. Nevertheless work did continue on the development of methods for making the diens—butadiene, isoprene, and dimethyl butadiene.

The World War brought about the first practical application of a butadiene homolog. The Germans, cut off from their supply of natural rubber, focused their efforts on the manufacture of a synthetic product because it was a vital necessity in the manufacture of military products.

There were developed and used in Germany during the period of the war three types of synthetic rubber: namely, Methyl Rubbers B, H, and W. All were made from dimethyl butadiene, the difference in their characteristics being obtained by modifying the conditions of polymerization. Methyl rubber was used alone and mixed with reclaimed rubber or with reclaimed and natural rubber.

Methyl Rubber B was used principally for wire insulation because it processed well, and compositions containing it could be tubed.

Methyl Rubber H could not be used in the manufacture of tires and was quite insoluble in solvents. It did, however, make an ebonite of excellent quality. It is said that ebonite made from Methyl Rubber H processed well, polished well, and was superior to natural rubber ebonite in its resistance to electrical breakdown. At the close of the war its production was about 30 tons a month, used in the manufacture of ebonite goods.

Methyl Rubber W was used principally for the manufacture of soft rubber-like products. It could be processed only with difficulty and, although cements could be made from it, the film left after evaporation of the solvent lacked tackiness.

The soft vulcanizates from these methyl rubbers did not approach very closely the characteristics of the soft vulcanizates of natural rubber. They were leathery, deficient in strength, extensibility, and resistance to abrasion and they did not age well. Had the value of carbon black as a compounding ingredient been known and had efficient antioxidants been developed at that time, the performance of methyl rubber in Germany during the war would have been quite different.

Although German experience had shown that the manufacture of methyl rubber was uneconomical and impractical in normal times, it did provide the stimulus for future research. The experience with methyl rubber ebonite demonstrated the superiority of synthetic rubber over natural rubber for certain properties. Their general experience with the broad problem indicated that the most practical approach to the synthesis of a rubber-like material lay in the development of homologs of isoprene.

The research program was abandoned for several years following the close of the war because of international economic and national political conditions and was not resumed until about 1925. The development of a practical source of supply for butadiene renewed interest in this subject. Methods of polymerizing butadiene were studied, and a number of experimental applications were made in both the soft and hard rubber goods industries.

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[1] Published by permission of H. E. Howe, editor, *Industrial and Engineering Chemistry*.

[2] Sales promotion engineer, Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

[3] Trade mark registered.

In 1933 the inauguration of the planned economy program of the National Socialistic regime caused a change in research attitude. National self-sufficiency was considered more important than commercial considerations, and the development of a new type of rubber, known as butadiene or "Buna" rubber, was undertaken. The approach to the development of Buna rubber is illustrated by the following paragraph quoted from a report of the British Department of Overseas Trade:[4]

"The manufacturers of 'Buna' report that the development of the new product owes much to the interest of the military authorities who, in Germany, are responsible for the purchase of all Government motor vehicles and who, therefore, exercise great influence on type and design and are able to further the experimental work such as has been necessary in connection with the development of 'Buna.'"

This is apparently the English method of intimating that German manufacturers of governmental rubber goods have no choice except to make these products of "Buna" rubber. It is generally understood that practically all the "Buna" rubber being used in Germany is for government agencies such as the postal department, army, or navy, and for government owned railways in products such as tires, belts, and railway hose.

"Buna" is chemically different from the methyl rubbers of wartime, and products made of it are equal to or superior to products manufactured from natural rubber. "Buna" rubber is polymerized butadiene, whereas methyl rubber is polymerized dimethyl butadiene.

There are presently manufactured in Germany three types of Buna: Buna identified by a number such as "Buna" 85 and "Buna" 115, "Buna" N, and "Buna" S. The first product is manufactured by the massive polymerization of butadiene with the aid of metallic sodium, and the other two are modified emulsion polymers.

The reports that have appeared in the press dispatches and in trade journals concerning the performance of products made from the "Bunas" probably have not been exaggerated. Each of the lettered "Bunas" has merit and can be used to produce products which possess properties surpassing similar products made from natural rubber. For example, products can be made from "Buna" N which are much more resistant to oil, more resistant to abrasion, less affected by changes in temperature, and less permeable to the passage of gases than similar products made from natural rubber. The excellent performance of "Buna" N and "Buna" S in tire treads is a fact.

The properties of "Buna" 85 and "Buna" 115 and their vulcanizates are more nearly like natural rubber than are those of "Buna" N or "Buna" S. "Buna" 85 and "Buna" 115 may be processed with the same equipment and with approximately the same ease as natural rubber to produce rubber-like products having the characteristics of products manufactured from natural rubber.

Unvulcanized "Buna" N and "Buna" S are much tougher and very much more difficult to work than either "Buna" 85 or "Buna" 115 or than natural rubber. They are so extremely difficult to process on conventional rubber machinery that they would probably be used only in rare products or only for highly specialized purposes except in a country where a policy of planned national economy exists and where the government controls raw materials and manufacturing processes.

The production of "Buna" rubber now amounts to about 60 tons monthly, but will shortly be increased by 200 tons monthly when production starts in a new plant being built in Germany. This will replace an equal amount of natural rubber and will be used alone and in combination with natural rubber.

The development of synthetic rubber-like materials in Russia has also been fostered and stimulated by planned national economy. Very little is known about the materials except from press dispatches and a few articles that have appeared in Russian scientific journals. No one outside of Russia has stated that he has seen or processed any synthetic material of known Russian origin. It is generally supposed that the greater part of Russian synthesized rubber is of the type of "Buna" 85 or "Buna" 115, and there is some doubt as to whether the quality approaches that of the German material.

It is reported that the Russians are polymerizing butadiene which they obtain by synthesis starting with ethyl alcohol and from porolysis of oil; 90% of their butadiene production is alleged to be produced from ethyl alcohol. It is probable that the Russians are using the polymers of butadiene in the manufacture of footwear, tires, and some other products.

In this connection it may be interesting to quote a German opinion of the economic situation in Russia, *The Berlin Ost-Europa*, a monthly journal published by the German Society for the Study of Eastern Europe, which states in its issue for December, 1935:

"In spite of the continual improvements of the production process and greater efficiency in the utilization of alcohol, the cost of production of synthetic rubber remains excessive. However, this does not seem to be a matter of concern to the Soviet Government. Its object is to save foreign exchange by curtailing imports of rubber . . . and, in case of war, to be independent in a degree of foreign raw materials. The same as the gradual reorganization of its entire tractor industry toward production of caterpillar-tread tractors—a measure which is not called for by any urgent economic consideration—the plan for the forced expansion of the rubber-making industry is primarily a part of the armament program."

In addition to polymerizing butadiene it is reported that Russia is producing substantial quantities of "Sovprene," which is probably identical with the American product, "DuPrene," since Russia does not recognize anything so capitalistic in nature as a patent.

Official publications of the Soviet Republic are quite optimistic as to the future possibilities of these synthesized materials and regard their self-sufficiency as practically accomplished. However their imports of natural rubber have been increasing over the past three years, which indicates a tremendous increase in the use of rubber goods or the building up of a reserve supply of crude rubber. All publications do point out that the development of butadiene and chloroprene rubber is aimed at national security and at being independent of foreign sources of supply in case of war, with only spasmodic attempts to prove that the use of the synthetic material is justified on an economic basis.

A report issued October 25, 1935, entitled "The Successes of Soviet Rubber" by O. Osipoff-Schmidt, manager of the synthetic rubber factories, contains a very interesting and illuminating statement. It might well have been lifted from the report of any American rubber technician. I quote—

"We shall make efforts still more to improve the quality of synthetic rubber—not because the quality of the present rubber is bad, but because it might be still better. Some of the workers of the rubber and the boot and shoe industries very often try to blame the new raw material—synthetic rubber, for the bad quality of the articles they produce. These comrades forget that the quality of rubber goods depends not only on the caoutchouc, but also on

[4] *India Rubber J.*, Aug. 8. 1936, p. 13.

the other materials which are combined with caoutchouc in the compound. We could present many facts showing that at the plants of the rubber industry and the artificial leather industry caoutchouc is used with admixtures of bad quality. This, as well as incorrect vulcanization, results in the bad quality of some of the articles produced at the said enterprises, irrespective of whether they are made of synthetic or natural caoutchouc."

I think the comrade would make a good rubber compounder.

The situation in Europe, from the limited information available, may be fairly well summarized as follows:

1. Certain homologs of isoprene can be processed on rubber making equipment to produce rubber goods of equivalent quality to those produced from natural rubber. In terms of our economic system these rubbers cannot be produced in competition with crude rubber.

2. Variations of these homologs produce goods having superior qualities to those made from natural rubber, but, in addition to their higher material cost, they require much more labor to process. It is doubtful whether any products of this type could justify their cost in terms of competitive economy; certainly very few of them could do so.

3. The manufacture of these homologs of isoprene is part of national economic planning programs laid down by the political heads of Germany and Russia, and they are being used in products which would be immediately required in case of war.

The necessary approach to commercializing a new product under our economic system is that a material must either be strictly comparative in cost to a product of equivalent quality or possess sufficiently superior properties to warrant a higher cost. The process of evaluating the superiority of a new product in relation to an existing product is known as commercial promotion.

The process of evaluating "DuPrene" is of general interest because it involves all of the intricacies of rubber compounding, manufacturing processes, and merchandising methods. The relation of materials' cost, labor, and overhead items are important in calculating the total cost of manufacture of products containing "DuPrene;" while the use, cost of maintenance, or possible change in practice on the part of the ultimate consumer of "DuPrene" products have a distinct relation to the value of the product to him or to his products.

A broad comparison of the cost of "DuPrene" as compared to foreign-made homologs of isoprene discloses that "DuPrene" is fundamentally somewhat cheaper to make although not competitive with crude rubber on the present market, or likely to be unless unusual conditions develop in connection with the production or distribution of crude rubber. On the other hand "DuPrene" possesses superior properties to natural rubber and has a further advantage over "Buna" N or "Buna" S in that it is processible on rubber-making equipment with only minor variations in methods. Furthermore the cost of making "DuPrene" can be reduced as the volume produced increases.

The reader will agree that the amount of effort spent in evaluating "DuPrene" for the needs of industry is certain to result in a better knowledge of the product than could be obtained by a forced and unconsidered use due to mandate or law. It is true that the necessity of economic evaluation is time consuming and often inaccurate, but the encouraging feature is the fact that such investigations are undertaken with the broad basic understanding that both manufacturer and consumer are expecting future improvements to take place and that the immediate problem is only one more step in a continuity of effort which will continue indefinitely. It is for this reason that both consumer and supplier expect a new material to stand on its own merits and insist that its value be demonstrated without regard to love of fatherland or the completion of a national objective.

Accompanying the presentation of this subject to the New York Group, Rubber Division, American Chemical Society, October 9, 1936, V. A. Cosler illustrated by lantern slides an imposing variety of products where the application of "DuPrene," because of its solvent resistant properties, has met economic needs in a manner never attainable with rubber compounds.

Rubber Seed

(*Continued from page* 35)

pressing 6.5%. The seed therefore was shown to have a total oil yield of 37.5% good oil, with little difference in quality shown between the products of the three pressings. The oil contained . . . about 4.9% free fatty acids. The oil would be a good substitute for linseed oil in those industries which use a cheaper quality of linseed oil, that is it could very well be used in the manufacture of linoleum and cheap paints. For the very reason that it corresponds with second quality linseed oil, it would probably have to be marketed at not more than two-thirds the price of good quality linseed oil."

There follows some discussion raising considerable doubt as to whether rubber-seed oil could be produced at such a cost that it could profitably be marketed at less than the price of competitive oils, like linseed oil. According to some further figures quoted, the cost of gathering the seeds is approximately f.0.03 a thousand; while it is stated previously that between 500,000 and 1,000,000 seeds are needed to yield one metric ton of the oil. This would place the cost price per ton for the harvesting and gathering only at between f.15 and f.30. This cost would therefore, of course, not include the cost of pressing and other necessary operations. It is admitted, however, that the collecting of the seeds is much more difficult on rubber plantations where undergrowth is permitted to surround the trees—and this is understood to be the usual practice on plantations nowadays. Moreover the seed is said to act as a natural fertilizer around the trees and planters are not anxious to see it gathered up.

In any case, rubber-seed oil is not at present being produced in Netherland India, and the whole matter of its possibilities still is in the experimental stage. The tremendous potential production of this oil in this country is obvious since rubber is the chief product of Netherland India.

The experiments referred to above also showed the following concerning the properties of rubber-seed oil:

	Average Figures
Specific gravity at 30° C.	0.918
Iodine number	127.000
Saponification number	192.000

TOTAL MINE PRODUCTION OF CRUDE BARYTES IN THE United States in 1935 was 218,075 short tons, an increase of 22% over the 1934 output and only 11% less than the average for the five-year period from 1925 to 1929, according to the United States Bureau of Mines. Total sales were 225,111 tons, value $1,251,268, an increase of 7% in tonnage and 13% in value over the previous year. Of the total sales, 59%, or 131,921 tons, originated in Missouri. Other states producing crude barytes were California, Georgia, Nevada, South Carolina, Tennessee, and Virginia.

Distributers' Tire Stocks

In the United States, October 1, 1936[1]

THIS report covers results of a survey of tire stocks held by both individual dealers and mass distributers. Returns from these two groups are discussed separately below. The report also provides new information regarding vulcanizing and retreading services performed by tire dealers, furnishing a basis for measuring the extent of adoption of such services among tire dealers for the first time. The survey was made with the support of The Rubber Manufacturers Association, Inc., and with assistance from the National Association of Independent Tire Dealers, Inc.

Average stocks per individual dealer, while lower now than a year ago, are at about the same level as in October, 1933, and 1934; the indication from less complete returns than heretofore is that mass distributers' stocks have increased to some extent as compared with October, 1935, and April, 1936.

I. Individual Dealers' Stocks

The regular survey of tire stocks in hands of dealers shows the following comparable statistics, as of October 1, for stocks held by retailers in 1936 as against 1935. The average number of automobile casings per dealer was 63.2 on October 1, 1936, compared with 68.4 on October 1, 1935.

DEALERS' STOCKS OF AUTOMOBILE TIRES

	October 1, 1935			October 1, 1936		
	No.	No. of Dealers Reporting	Average per Dealer	No.	No. of Dealers Reporting	Average per Dealer
Total casings ...	831,935	12,160	68.4	775,175	12,274	63.2
High pressure ..	77,816	6,993	11.1	*	*	*
Inner tubes	1,013,087	12,305	82.3	999,439	12,550	79.6
Solids	24,346	264	92.2	30,864	323	95.6

*Question not asked in 1936.

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to the survey of October 1, 1935, which shows this year a larger percentage of dealers in groups holding less than 25 casings per dealer, and a smaller percentage in each group holding higher average stocks.

DEALERS CLASSIFIED BY VOLUME OF STOCK

	October 1, 1935			October 1, 1936		
	No. of Dealers	% of Total Dealers	No. of Casings	No. of Dealers	% of Total Dealers	No. of Casings
Less than 10...	2,600	21.38	13,337	2,763	22.51	14,121
10 — 24...	3,336	27.45	53,510	3,677	29.96	58,424
25 — 49...	2,818	23.17	97,288	2,650	21.59	91,653
50 — 99...	1,790	14.72	123,154	1,619	13.19	111,164
100 — 199...	876	7.20	119,837	865	7.05	117,018
200 — 299...	292	2.40	69,643	291	2.37	68,207
300 — 399...	142	1.17	47,738	141	1.15	48,101
400 — 999...	212	1.74	124,168	195	1.59	114,709
1,000 and over.	94	0.77	183,260	73	0.59	151,778
	12,160	100.00	831,935	12,274	100.00	775,175

The following table compares average stocks per dealer reporting each item on October 1 in the surveys of 1927 to 1936, inclusive.

[1] Special Circular No. 3,624, Department of Commerce, Bureau of Foreign and Domestic Commerce, Leather and Rubber Division, Washington, D. C.

AVERAGE STOCKS PER DEALER ON OCTOBER 1

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Total casings...	57.6	64.8	68.4	62.4	60.2	71.3	61.3	63.8	68.4	63.2
Balloon casings.	30.7	44.0	*	*	*	*	*	*	*	*
High pressure..	*	*	22.9	14.5	11.3	12.0	9.8	10.4	11.1	*
Inner tubes....	103.1	107.4	103.4	89.2	80.8	92.3	77.2	78.3	82.3	79.6
Solids, etc.	26.1	23.4	24.2	22.7	19.1	20.2	27.4	35.6	92.2	95.6

*Information not tabulated in survey indicated.

In recent years the percentages of dealers handling one, two, three, and four makes of tires have not changed greatly. At the pit of the depression, in 1932, the percentage handling more than two makes was at a low point not subsequently reached; a slight tendency toward handling in increased number of makes seems evidenced by the figures for the years 1935 and 1936.

NUMBER OF MAKES HANDLED BY DEALERS

(Percentages of Total)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Number of Makes:										
One	48.6	54.9	64.2	70.3	70.5	70.2	69.7	70.2	69.2	65.3
Two	35.5	33.7	27.4	23.5	23.7	24.3	24.6	24.2	24.7	27.3
Three	11.2	8.5	5.9	4.3	4.1	3.9	3.7	4.1	4.5	5.0
Four, five, and six	4.7	2.9	2.5	1.9	1.7	1.6	2.0	1.5	1.6	2.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Reports Received by Cooperation of N.A.I.T.D.

In this survey for the first time, the mailing list of the National Association of Independent Tire Dealers, Inc., was circularized by cooperation of the association, and as a result, returns were received from 309 firms. The stocks reported were as follows:

	Reports	Stocks
Automobile casings	305	113,039
Inner tubes	306	124,096
Solid tires	23	907

Of these firms, 65% handled one make, 26.5% handled two makes, 4.9% handled three makes, and 3.6% handled four or more makes. Forty firms reported less than 25 casings each, 51 firms from 25 to 49 casings, 49 firms from 50 to 99, 45 from 100 to 199, 23 from 200 to 299, 49 from 300 to 499, 28 from 500 to 999, and 24 reported 1,000 or more casings in stock; the overall average per firm was slightly over 370 casings each. These statistics were not included with tabulations shown above since their inclusion would have rendered the data not comparable with past surveys; these returns were additional to those received in the regular survey, a few duplications having been removed in tabulating.

Dealers Offering Vulcanizing and Retreading Services

The growing importance of tire retreading in recent years, and the dearth of statistical information on the subject, led to the inclusion of questions on retreading in addition to questions on tire vulcanizing service, in the current survey. The dealers reporting that they offered vulcanizing service for passenger car tires represent 10.6% of the total number reporting, and those offering retreading service for passenger car tires represent 3.1% of the total number, the percentage offering these services for truck tires being lower in each instance. This tabulation includes returns received too late for inclusion elsewhere.

	No.	% of Total
Total reports received	12,890	100.0
Vulcanizing service for:		
Passenger car tires	1,368	10.6
Truck tires	803	6.2
Retreading service for:		
Passenger car tires	398	3.1
Truck tires	270	2.1

If one were to apply these percentages to an estimated total number of dealers, an estimate of the number of dealers offering such services would result; on a basis of 100,000 dealers, for example, the estimate would be 10,600 firms which vulcanize passenger car tires and 3,100 firms which offer retreading service for passenger car tires. The Business Census for 1935 reports 2,060 tire repair shops under "Service Establishments" not including tire and battery *stores* shown elsewhere under the census of retail trade, many of which no doubt offer these services as sidelines.

A special tabulation shows that a much higher percentage of the *larger* tire dealers than of the smaller outlets dealing in tires offer these services, as follows:

NUMBER OF DEALERS OFFERING TIRE SERVICES, BY GROUPS

Casings Reported	No. of Firms	Vulcanizing Tires: Passenger Car	Vulcanizing Tires: Truck	Retreading Tires: Passenger Car	Retreading Tires: Truck
Under 100	11,345	858	428	219	133
100—199	851	210	133	60	38
200—299	291	112	82	34	24
300—499	212	88	71	28	23
500—999	119	66	59	33	31
1,000 Plus	72	34	30	24	21
Total	12,890	1,368	803	398	270

PERCENTAGE OF DEALERS OFFERING SERVICES BY GROUPS

Under 100	100.0	7.6	3.8	1.9	1.2
100—199	100.0	24.7	15.6	7.1	4.5
200—299	100.0	38.5	28.2	11.7	8.3
300—499	100.0	41.5	33.5	13.2	10.8
500—999	100.0	55.4	49.6	27.7	26.0
1,000 Plus	100.0	47.2	41.7	33.3	29.2

A similar *percentage* calculation was made for the 309 firms which reported as a result of circularization by the National Association of Independent Tire Dealers, as follows:

Casings	Firms	Vulcanizing: Passenger Car	Vulcanizing: Truck	Retreading: Passenger Car	Retreading: Truck
Under 100	100.0	27.9	18.6	5.7	5.7
100—199	100.0	42.2	40.0	15.6	15.6
200—299	100.0	60.9	56.5	26.1	26.1
300—499	100.0	53.1	47.0	20.4	22.4
500—999	100.0	67.8	64.3	46.4	39.3
1,000 Plus	100.0	58.4	54.2	25.0	25.0

Note that a higher percentage of these firms, in the respective groups, offer tire repair services, than of the firms reporting in the regular dealer survey.

II. Large Mass Distributers' Stocks

As in previous surveys, reports were received from oil companies and companies distributing through oil and gas outlets, each having more than 100 retail outlets, handling either private brand or tire company brand tires, and the data obtained are compared with previous surveys as follows:

	Reports Received	Stations Served	Casings on Hand	Inner Tubes on Hand
October 1, 1936	19	45,139	1,140,609	1,143,951
April 1, 1936	20	46,371	1,000,406	1,323,316
October 1, 1936	16	47,570	1,070,811	1,276,211

Stocks held by retail outlets operated by tire manufacturers, wholesale and retail outlets operated by mail-order companies, and other chain-store distributers were reported as follows in comparison with similar data reported by identical companies in the survey of April 1, 1936. This year reports were not received from one manufacturer and two mail-order houses previously included; so statistics for those companies have been omitted from the preceding survey for reasons of comparability.

	Reports Received	Retail Stores	Casings on Hand	Inner Tubes on Hand	Solids on Hand
April 1, 1936	7	2,017	942,182	929,152	2,123
October 1, 1936	7	2,076	1,044,998	1,102,668	2,950

The less complete returns under this group of mass distributers make definite conclusions as to the present extent of their total stocks impossible. However the above comparison indicates probability of an overall increase in such stocks, and so far as data are available in our files, a similar increase was registered in comparison with stocks on October 1, 1935.

III. Summary

Reports actually received are summarized as follows:

	Reports Received	Retail Outlets*	Casings on Hand	Inner Tubes on Hand
Dealers	12,274	12,274	775,175	999,439
N.A.I.T.D.	306	306	113,039	124,096
Large Mass Distributers:				
Oil companies	16	47,570	1,070,811	1,276,211
Others	7	2,076	1,044,998	1,102,668
Total	12,603	62,226	3,004,023	3,502,414

*Sub-dealers and sub-outlets are not included, except under "oil companies."

Manufacture of "Thiokol"

(*Continued from page* 40)

power wires. Lead is heavy and therefore expensive. Furthermore it corrodes underground, is affected by electrolysis and "stray currents." The first "Thiokol"-sheathed cable was made in 1933, and since then this kind of cable has been used in western Europe as well as in the United States and is also being developed now for use in Japan.

Being oil-proof, "Thiokol" goes into rubber drop cords for garages and machine shops and for cables in chemical plants where there are corrosive fumes that attack rubber.

Commercial aviation has opened new and profitable fields for "Thiokol," since it is used in fuel hose and in hose for servicing the planes, similar to those for servicing automobiles. The United States Air Corps includes it in specifications for fuel hose for its ships.

The printing industry also has recognized the advantages of this relatively new raw material, and today 1,500 newspapers of the country, including some of the largest, are using printing blankets made of it. Such blankets must be soft, resilient, and pliable. Rubber blankets, when introduced years ago, were believed to have all the desired qualifications until it was found that they swelled through absorption of the ink vehicles and had to be frequently replaced. "Thiokol" blankets, by eliminating these disadvantages, met with immediate success, and have proved to last at least twice as long as those made of rubber.

IMPORTS OF CRUDE BARYTES FOR CONSUMPTION IN THE United States in 1935 totaled 47,047 short tons, value $246,254, an increase of 18% on tonnage and 41% in value over 1934. Shipments from the Netherlands, 20,752 tons, accounted for 44% of the total imported. Spain has become an important source for barytes for the U. S., shipping 15,401 tons in 1935 against 6,720 tons in 1934.

U. S. manufacturers of barium products and chemicals reported a production of 276,512 tons in 1935. Sales amounted to 268,652 tons, value $16,858,413.

Synthetic Rubber

Joseph Rossman, Ph.D.

THE following abstracts of United States patents dealing with synthetic rubber continue the informative article from our November issue.

75. Herbold, 1,151,948, Aug. 31, 1915. To make elastic substances dilute fatty materials with inert solvents, treat the diluted materials with halogens, expel the inert solvents, heat the halogenized fatty materials with sulphur, and wash the resulting product.

Example 1: 15 kilograms of gaseous chlorine are passed at normal temperature into 100 kilograms of castor oil. As soon as the whole of the chlorine has been taken up, carbonic acid gas is passed into the halogenized oil until the hydrochloric acid is expelled. Then to the chlorinated product are added 20 kilograms of sulphur, and the mixture is vigorously stirred and heated gradually to a temperature of from 150 to 200° C. until the sulphur is entirely absorbed. This procedure takes from one hour to three hours, according to the temperature employed. After cooling down, the elastic substance may, if desired, be washed in a roller machine as usual.

Example 2: 100 kilograms of fish oil are slowly mixed with 12 kilograms of bromine while the mass is stirred. The resulting hydro-bromic acid is washed out with water, and the brominated washed product mixed with 22 kilograms of sulphur. The mixture is then heated as in Example 1, and the product obtained washed with water after cooling, if desired.

76. Nuth, 1,159,257, Nov. 2, 1915. To make a rubber-like substance subject a factice to the action of a suitable ammonia derivative in the presence of a substance facilitating the reaction.

77. Nuth, 1,159,258, Nov. 2, 1915. To make rubber-like substances subject a factice to the action of an amin; harden the substance thus produced, and subsequently vulcanize with sulphur.

78. Satow, 1,245,979, Nov. 6, 1917. To manufacture a rubber substitute glutinize vegetable proteids and then mix a sticky viscid agent and an active methylene compound and vulcanize castor oil with the glutinized mass.

79. Carter, 1,251,862, Jan. 1, 1918. A composition adapted for use as a rubber substitute contains the reaction product of China wood oil and sulphonates derived from tar acids.

80. Carter, 1,251,863, Jan. 1, 1918. A composition for use as a rubber substitute contains the washed and dried product resulting from the action of formaldehyde on the reaction product of a mixture of sulphonates derived from tar acids with China wood oil, to which free tar acids have been added.

81. Ellis, 1,276,507, Aug. 20, 1918. (Reissue, 14,570, Dec. 17, 1918.) A composition solid at atmospheric temperatures comprises a mixture including a hydrogenated oil, a waxy material, and a resin.

82. Ellis, 1,276,508, Aug. 20, 1918. (Reissue, 14,569, Dec. 17, 1918.) A composition embraces hydrogenated cottonseed oil of high melting point solidified in contact with an impalpable non-fatty inert solid material of an unctuous feel; the solid material is present in an amount in excess of the oil.

83. Ellis, 1,276,509, Aug. 20, 1918. (Reissue, 14,568, Dec. 17, 1918.) A composition comprises a mixture including a hydrogenated oil non-liquid at ordinary room temperature and a non-fatty solid material devoid of catalytic properties.

84. Cohen, 1,280,129, Oct. 1, 1918. A vulcanized composition consists of linseed oil oxidized at 200 to 250° C., aluminum salt of a higher fatty acid, an inert filler, and sulphur.

Example: one part of aluminum stearate is dissolved in the same or a smaller quantity of ozocerite, paraffin wax, or the like. This solution in cold (solid) or heated (molten) condition is combined with from four to ten times its quantity of oxidized linseed oil at a temperature of about 200 to 250° C. The oil may be obtained in known manner, for example, by heating linseed oil during a considerable period with manganese peroxide or similar oxidizing agent.

85. Talley, 1,285,463, Nov. 19, 1918. The process of making artificial rubber consists in compounding two separate mixtures, one mixture comprising a vulcanizable vegetable oil, resinous hydrocarbon bodies, and camphor, and the other mixture including a vulcanizable vegetable oil, white lead, powdered shale, and ground asbestos; combining the two mixtures; subjecting them to heat under a suitable pressure of steam; vulcanizing; and, when partially cooled, subjecting the mass to pressure.

86. Snelling, 1,315,246, Sept. 9, 1919. The process comprises reacting upon a vegetable oil with a sulphurizing agent in the presence of enough of a depolymerization-assisting agent to produce, when the sulphurized mass is heated, a soft plastic product, and boiling the sulphurized mass in water until such a soft, plastic product is obtained.

87. Gregory, 1,321,788, Nov. 11, 1919. The process consists in combining fish oil and sulphur by gradually adding the latter to the former and at the same time heating the mixture in an open vessel at increasing temperatures of from 175 to 220° C., and then adding a further amount of sulphur and a metallic oxide, and finally heating this mass under pressure.

88. Hazeltine and Gregory, 1,360,744, Nov. 30, 1920. The process of producing a rubber-like substance consists of mixing 80 parts fish oil and 20 parts sulphur, expelling practically all air and moisture, subjecting the mixture to approximately 170° C. under pressure about two hours, meanwhile agitating the mixture.

89. Snelling, 1,376,172, Apr. 26, 1921. The process comprises confining a mixture of a vulcanizable oil and sulphur chloride in the presence of the vapors produced by their reaction under superatmospheric pressure until depolymerization of the vulcanized product formed at first occurs.

90. Snelling, 1,376,173, Apr. 26, 1921. A vulcanized oil product comprises liquid vulcanized oil compounded with a solid vulcanized oil.

91. Snelling, 1,376,174, Apr. 26, 1921. A liquid vulcanized oil product is capable of transformation into a solid factice-like material on contact with water.

92. Wichmann, 1,379,150, May 24, 1921. A process of making a rubber-like substance comprises macerating the fleshy parts of the *Yucca* plant, heating them above the boiling point of water, extracting the juice therefrom, adding a catalyzer consisting of a mixture of sodium tungstate, concentrating the juice, adding a solution of Para rubber, linseed oil, and a molten solution of asphaltum and sulphur to the concentrated juice, boiling the same under agitation, and drying and oxidizing the resulting mass.

93. Scobel, 1,383,864, July 5, 1921. A solid is produced by thoroughly disseminating an active metallic halogen derivative through China wood oil by any suitable means, having no definite melting point, which increases the resiliency with increase in temperature and is susceptible to further toughening by exposure in air and moderate heat.

94. Snelling, 1,430,034, Sept. 26, 1922. To produce vulcanized oil products react upon a fatty oil with sulphur chloride in excess of the amount required to produce vulcanization; thereafter bring the resulting product into contact with water.

95. Hocker, 1,512,024, Oct. 21, 1924. To make a molded article gelatinize a material capable of engendering fatty acid and glycerine, reduce the resiliency of the gelatinous product, add thereto a filler, and press the whole into the desired shape.

96. Kuhn, 1,522,822, Jan. 13, 1925. An artificial composition of elastic nature is composed of an intimate mixture of caoutchouc material with an acetylene condensation product (cuprene).

97. Linder, 1,590,765, June 29, 1926. The process of molding resilient articles consists in vulcanizing fatty oils at room temperature under pressure to retain the greater portion of the air and gas cells in the article and reduce the size thereof sufficiently so that they will not be detrimental to the finished product.

98. Frankenburger and Steigerwald, 1,756,943, May 6, 1930. This patent covers a process for the production of artificial compositions resembling rubber in which a derivative of vinyl alcohol is polymerized by heat treatment in the presence of a proteid.

Example: finely powdered albumin is suspended in vinyl acetate, and the mixture, together with a small amount of benzoyl peroxide, is heated from 80 to 90° C. on the water bath, with active shaking or stirring. Polymerization soon ensues. According to the working conditions, a very elastic skin, or compact elastic mass, is obtained.

99. Harvey, 1,771,785, July 29, 1930. A rubber substitute with cashew nut shell liquid as its base is set with a vulcanizer comprising sulphur.

100. Harvey, 1,771,786, July 29, 1930. The method comprises heating cashew nut shell liquid and sulphur together to about 240° F.

101. Houques-Fourcade, 1,772,218, Aug. 5, 1930. To manufacture a plastic material from seaweeds treat them with alkalized water, eliminate the non-dissolved parts of the resulting mass, treat the remaining viscous mass with a sulphur vulcanizing material, and add a solution of a preserving substance to the mass finally obtained.

102. Bruson, 1,783,167, Nov. 25, 1930. A composition of matter comprises the reaction product of castor oil, glycerol, and adipic acid.

Example 1: 64.4 parts of glycerol, 212 parts of sebacic acid, and 166 parts of raw castor oil were heated to 170 to 175° C. in an open vessel fitted with a stirrer. After ten hours a very tough, rubbery mass is formed, which is fluid while hot. Upon cooling, however, it forms a stiff jelly soluble in butyl acetate, acetone, ethyl acetate, glycol ethers, but insoluble in ethyl alcohol, butanol, or toluol.

By heating the mixture for about 16 hours the jelly becomes insoluble in all organic solvents. One hundred parts of this insoluble material, which forms a tough, rubbery mass when cold, is ground in a paint grinder with 200 parts of butyl acetate. It forms a homogeneous solution, which upon evaporation deposits a tough, adherent rubbery film which is resilient and adherent.

Example 2: 55 grams glycerol, 181.8 grams sebacic acid, and 189.6 grams raw castor oil are heated in an open vessel with agitation at 190 to 200° C. After about ten hours a very rubbery product results which differs from that obtained in Example 1 in being soluble in butanol and in toluene. If heated five or six hours longer, it too forms a rubbery mass insoluble in all organic solvents, but capable of mastication on a rubber mill to a completely soluble product.

103. Zobel, 1,786,281, Dec. 23, 1930. A composition having substantially the physical properties of soft rubber comprises a product obtainable by heating a mixture of gum copal and hard wood creosote oil until a clear solution is formed, and causing precipitation by the addition of petroleum naphtha, the composition being insoluble in water, partly soluble in acetone, and soluble in carbon bisulphide.

104. Baer, 1,828,587, Oct. 20, 1931. To manufacture sulphuretted oils, in particular factice soluble in hydrocarbons, heat oils with a caoutchouc-like body obtained from the reaction of ethylene dichloride and calcium polysulphide.

Example: 500 parts by weight of raw rapeseed oil are heated to 170° C. with 500 parts by weight of the caoutchouc-like body obtained according to the above-mentioned application, say from ethylene dichloride and calcium polysulphide, when in a short time a reaction takes place, and the caoutchouc-like body dissolves and is transformed into factice, soluble in benzene, chloroform, ethylene chloride, etc. Instead of the polymerization products of ethylene dichloride and calcium polysulphide, also used may be those of methylene dichloride, ethylene dibromide, methylene dibromide, and other saturated halogenized hydrocarbons and alkali metal or alkaline earth-metal polysulphides, such as potassium or sodium polysulphide.

105. Winkelmann, 1,841,235, Jan. 12, 1932. The process of producing a viscous, pitchy material from pine tar oil comprises blowing air through it at an elevated temperature in the presence of a small proportion of sulphur.

Example 1: the ingredients to be treated, comprising 100 parts by weight of pine tar oil and two parts of sulphur, are placed in a flask equipped with an efficient condenser to return to the flask any of the constituents of the pine tar oil volatilized during the heating. The pine tar oil and sulphur admixture, heated to 90° C., is maintained at this temperature 24 hours, while air is blown through it. The yield found is 99%, and the resulting product is a liquid of much greater viscosity than the original pine tar oil.

Example 2: medium pine tar oil is admixed with 2% sulphur and heated under reflux at 90° C., and air blown therethrough for 24 hours as in the preceding example.

106. Gillespie, 1,869,557, Aug. 2, 1932. To manufacture a white rubber factice mix a non-mineral oil, sulphur monochloride, a stabilizer, and a volatile ammonium salt and maintain the mass at a temperature below that at which the salt will materially decompose until vulcanization is complete. *(To be concluded)*

Editorials

Crude Rubber Price Regulation

IT HAS been shown by Walter H. Dickerson in his article "An Unparalleled Problem," published in our July issue, that the widely fluctuating price of crude rubber during years past has been primarily responsible for the rubber industry's major difficulties. A realization of this factor led to the idea of regulating supply with demand to obtain price stablization over a protracted period of time.

The first attempt was the Stevenson plan, which achieved nothing but additional chaos. The period of no regulation which followed added to that chaos to a degree that threatened disruption of the entire industry, but undoubtedly hastened the formation of the present plan which has policies that are designed to eliminate the weaknesses of its predecessor. Its success over a long period of time, if continued beyond its present term, which seems likely, depends quite largely on the ability of the members of the International Rubber Regulation Committee to prognosticate the direction and degree of the trends of rubber consumption many months in advance, also on the accuracy of its judgment in fixing export quotas at the proper point and in time to prevent even a temporary shortage of crude rubber, particularly in the United States. This latter condition takes on increasing importance when the world stock position stands in the region of supposedly safe minimums.

When rubber restriction began in 1934, the world stock of rubber approximated ten months' supply, while that of the United States exceeded one year's, a condition which, unless regulated, was destined to bring disaster to producers and perhaps ultimately to many manufacturers. Since then both positions have been continuously receding until now the United States stock including rubber afloat is barely six months' supply and that of the world about seven.

According to leading opinions in this country, the present stock situation is economically about the correct one, but apprehension arises out of the possibility that stocks are destined to reach much lower positions before the decline can be arrested. On the 65% export basis established for the last six months of 1936, which has not reflected its effect as yet, production of crude but slightly exceeds the average monthly consumption established during the first seven months of this year, and the consumption rate is definitely growing.

Even with the recently set 70% basis to apply during the first six months of 1937 it is very questionable if the decline in stock position will be entirely arrested, particularly in view of the encouraging prospects for a substantial increase in the 1937 demand for tires, and rubber goods in general.

Rubber manufacturers in the United States are justified in being particularly thoughtful about the situation when it is considered that they consume half the rubber absorbed in the world; they depend for their crude rubber supply on foreign countries whose production interests exceed by far their manufacturing interests; the only representative of United States manufacturers in the restriction plan, Colonel A. F. Townsend, has only an advisory, not a voting capacity; and because of their distance from producing countries the rubber represented by 1½ to two months' supply shown in our stock figures is not available for production distribution as it is in transit.

Certainly the producers' best interests reside with those of the manufacturer, of which class the United States takes a most prominent position. It would seem logical that the safest course to pursue for the best interests of both would be that of keeping stocks safely above the intangible minimum, yet sufficiently low to assure price stability. The experience of the past year would serve to indicate that prices can be maintained and that without flirting with the danger point of stock position.

Berry Studies Rubber Industry

INTERESTING facts pertaining to the rubber industry have resulted from a study prepared in the office of George L. Berry, co-ordinator for industrial co-operation. Among them appear the following:

During the four depression years 1929 to 1933 the estimated number of establishments engaged in the manufacture of rubber products dropped from 525 to 408, of which the largest percentage were plants engaged in tire manufacture which suffered a decrease of 51.6% in number.

The average yearly number of wage earners in this manufacturing group, which was 74,022 in 1914, rose to 158,549 in 1919 and fell back to 149,148 in 1929, falling still further to 106,238 in 1933.

The wage level was comparatively high in recent years, climbing from $597 in 1914 to $1,222 in 1919, $1,390 in 1929, and dropping to $933 in 1933.

The productive capacity of the wage earner was $1,864 in 1914, climbed to $3,430 in 1919, and $3,612 in 1929. After two years of depression this figure climbed to $3,541 in 1931, but in 1933 dropped back to $2,400.

The figures given were taken from the 1933 industrial census as those for the 1935 census are not available.

D C McRoberts

EDITOR

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

Los Angeles Group

THE Los Angeles Group, Rubber Division, A. C. S., held a meeting November 4 at the University Club, 614 S. Hope St., Los Angeles, Calif. Following the dinner the members were treated with cigars supplied by H. M. Royal, Inc., through the courtesy of J. M. Huber, Inc.

In view of the general interest of the program planned for this meeting fathers were requested to bring their sons, and many did so.

C. A. Carlton, manager of the Huber plant at Borger, Tex., discussed "Laboratory Methods for the Evaluation of Carbon Black in Rubber."

H. W. Peterson, district traffic manager, Pan American Airways, featured "Flying the Lindbergh Trail," the first serial aerial motion pictures of South America, showing the crossing of the Andes and many dramatic jungle scenes in the circuit of 33 countries.

Mr. Blackton, of Reginald Denny Industries, Inc., was present with the local boy winner of the miniature airplane contest and displayed some interesting airplane models.

Gordon D. Brown, of Douglas Aircraft Co., Inc., speaking on "Commercial Aviation," told how safety and comfort have been developed by American aviation companies.

Two tickets to the Notre Dame-Southern California football game were raffled. The winner was James Stull, of Santa Fé Rubber Mills. Door prizes were donated by A. Kroegar, of Rubber Service Laboratories Division of Monsanto Chemical Co. and won in order as follows: first, J. K. Fleshman, United States Rubber Co.; second, C. L. Remy, United States Rubber; third, G. G. Balazs, Goodyear Tire & Rubber Co.

The annual election of officers will be held at the next meeting scheduled for December 1 at the Los Angeles Athletic Club. Door prizes are to be donated by R. D. Abbott, of the C. P. Hall Co.

Chicago Group

THE first technical meeting of the fall season of the Chicago Group, Rubber Division, American Chemical Society, was held November 13, at the Hotel Sherman. Jacob Kirschner, chief chemist, Dryden Rubber Co., presided as chairman and presented a program of great interest. After a lavish dinner and floor show came the technical program.

The paper of the evening was presented by Arthur W. Carpenter, manager of the physical testing laboratories, The B. F. Goodrich Rubber Co. He discussed the various types of apparatus that may be used in making aging tests and rate of deterioration tests on rubber compounds. He had with him a very large number of rubber samples, showing the effects on various compounds before and after aging. Aging tests were made on different methods. The exhibit was quite complete and was the cause of considerable discussion. At the conclusion of his talk copies of the paper were distributed to the members to be read at their leisure.

Simon Collier was a surprise visitor at this meeting. Formerly of the Johns-Manville Waukegan plant, he has been placed in charge of inspection and control work for all Johns-Manville factories. Mr. Collier was chairman of the Chicago Group in 1933 and 1934 and an active worker. Many of the present plans and policies were originated by him.

The Chicago Group will hold its Christmas meeting December 18 at the Hotel Sherman. The complete program will be released December 7.

Boston Group

THE Boston Group, Rubber Division, A. C. S., held its fall meeting November 24 in the Crystal Room of Hotel Kenmore, Boston, Mass., with an attendance of approximately 125 members and guests. Following the dinner, which was served at 7 p.m., a short business session was held to elect officers for the coming year. Those elected were: chairman, Dr. Royce J. Noble, consulting chemist, Malden, Mass.; secretary-treasurer, G. W. Smith, Barrett Co.; and an executive committee consisting of the group's retiring chairman, John T. Blake, chief chemist, Simplex Wire & Cable Co., and two elected members, R. D. Huber, of the D. R. Litter Co., and E. A. Krisman, of E. I. du Pont de Nemours & Co., Inc.

The paper originally scheduled to be given by Dr. J. R. Katz, of the University of Amsterdam, was cancelled because of his illness, which now confines him to the hospital. In place of Dr. Katz's paper Henry Morse, Simplex Wire & Cable, gave an illustrated lecture covering his research on "The Structure of the Rubber Molecule." Dr. Morse's mathematical deductions supported by his newly devised means of making X-ray photographs of the crystalline structure of rubber was conceded to add valuable contributions to the work of other investigators of this fundamental problem.

Another most interesting and instructive paper was given by Dr. I. Drogin, chief chemist, J. M. Huber, Inc., New York, N. Y., entitled "An Outline of Carbon Black." Numerous lantern slides were shown and described by the speaker, which gave a very intimate understanding of the practical operations, equipment, and problems involved in the controlled manufacture of carbon blacks of various kinds for all types of service in rubber, ink, paint, and miscellaneous commodities. Charts were also presented showing the characteristic properties given to rubber by several types of black as shown by the defined T-50, compression flexing, abrasion, and colorimetric standard measurements.

New York Group

THE annual election of officers for next year will take place at the Christmas dinner party of the New York Group, Rubber Division, A. C. S., scheduled for Friday night, December 18, in the clubrooms of the Building Trades Employers Association, 2 Park Ave., New York, N. Y.

To keep the length of the program within bounds no technical paper will be presented, but instead Walter P. Voth, of Akron Standard Mold Co., Akron, O., will talk on "Modern Methods of Curing Rubber Articles," illustrated by moving pictures. Another movie shown by Harry Day will depict the use of slow motion in the study of manufacturing details.

During the evening an entertainment of instrumental music and songs will be rendered by Jack Whitehead, of the Seamless Rubber Co., New Haven, Conn. The balance of the evening will be devoted to distributing gifts.

Tickets for the dinner and entertainment at $2.50 each may be reserved by addressing Peter P. Pinto, secretary-treasurer in care of *Rubber Age*, 250 W. 57th St., New York.

A.S.T.M. Rubber Research Projects

THE recently reviewed research work of the American Society for Testing Materials summarizes 126 projects on which A.S.T.M. committees are at work. Among them are the following relating to rubber products, under the supervision of Committee D-11.

Abrasion Test for Rubber Products. Consideration of abrasion tests for application to those rubber products where abrasion in service is the most important element in determining the life of the material, such as conveyer belting, automobile tires, rubber-covered air and water hose, rubber heels, etc. Procedures covering the six most widely used tests for abrasion resistance of rubber compounds issued as tentative, see *Proceedings,* Vol. 34, Part I, p. 1150 (1934). Work being done to establish standard rubber test specimens having certified and tested properties for use as a reference base in testing, see preprint, 1936 Report of Committee D-11.

Vibration Absorption of Rubber Products. Study, development, and standardization of methods of test which are particularly suitable in the evaluation of rubber stocks for shackles, motor supports, bumpers, and shock insulators. Studying effect of repeated compression on rubber compounds and flow properties of rubber. Method of test for compression set of vulcanized rubber used for vibration absorption covering procedures for compression set under constant load and constant deflection, respectively, issued as tentative, see preprint, 1936 Report of Committee D-11.

Properties of Rubber and Rubber-Like Materials in Liquids. Study of volume changes of rubber compounds when subjected to the action of oils or various solvents and the development of suitable test methods for comparing the swelling properties. See paper by O. M. Hayden, "The Testing of Rubber and Rubber-Like Materials for Oil Resistance," *Proceedings,* Vol. 34, Part II, p. 635 (1934). Determination of suitable shape and size of test specimens for a standard test being studied by five cooperating laboratories, see *Proceedings,* Vol. 35, Part I, p. 427 (1935).

Life Test for Rubber Products. Accelerated aging tests of various types of rubber compounds in comparison with natural aging of the same samples. Methods of test for accelerated aging of vulcanized rubber developed, see *Proceedings,* Vol. 35, Part I, p. 1167 (1935). Method of test for effect on rubber compounds of air at elevated pressures and temperatures now being studied, see preprint, 1936 Report of Committee D-11.

Dynamic Fatigue Testing for Rubber Products. To study the general field indicated in title and particularly as applied to repeated extension, compression, bending, and similar tests. Studying separation tests on plied rubber and fabric materials. Methods including three different types of apparatus and procedures for flexing tests of rubber products developed, see *Proceedings,* Vol. 35, Part I, p. 1186 (1935).

Adhesion of Rubber to Metal. Study, development, and standardization of methods for measuring the adhesive strength of rubber to metal with particular reference to such applications in the automotive industries. Methods of test for adhesion of vulcanized rubber to metal developed, see *Proceedings,* Vol. 35, Part I, p. 1180 (1935).

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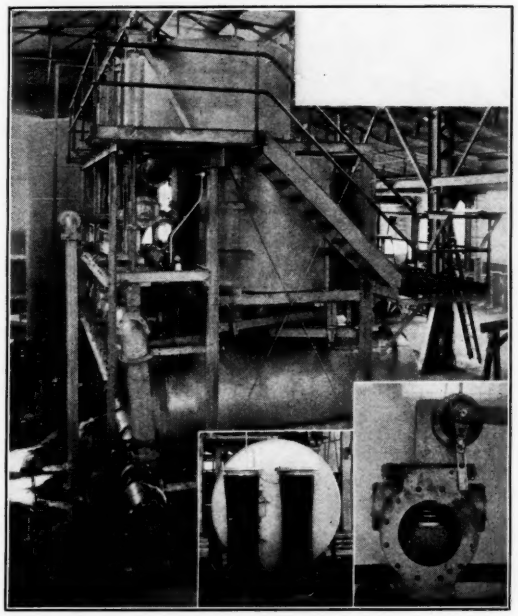
New Machines and Appliances



Largest Oil and Gasoline Automatic Weighing Scale

Largest Automatic Scale for Oil and Gasoline

CONSPICUOUS among gigantic mechanical innovations of precision developed by machine builders is the world's largest automatic electric liquid weighing scale, recently perfected by engineers of Richardson Scale Co. for the Cuban government where it will be used to weigh receipts of gasoline and oil from oil tankers.

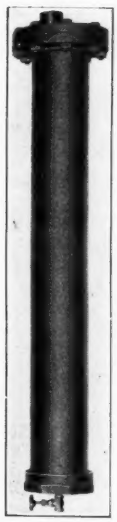
Two lengths of Manhattan Rubber Mfg. Division 12-inch G.O.P. flexible gasoline-proof hose and Manhattan G.O.P. valve seats engineered specially for their important functions play essential parts in the scale's rapid, leakproof, and accurate weighing, which has a capacity of 27,500 pounds of gasoline or oil per minute with the remarkably low error of less than 1/900 of 1%, although only guaranteed to 1/10 of 1%.

Special Manhattan flexible hose (see left insert of accompanying illustration), between the feed pipe and the two floating weighing tanks, conveys the liquid to weighing tanks without setting up any resistance to the necessary motion of the tanks mounted on the scale levers, which resistance would affect the accuracy of weighing. The gasoline-proof synthetic rubber valve seats (see right insert) permit instant stopping of the liquid flow at the proper moment and are impervious to the action of the gasoline.

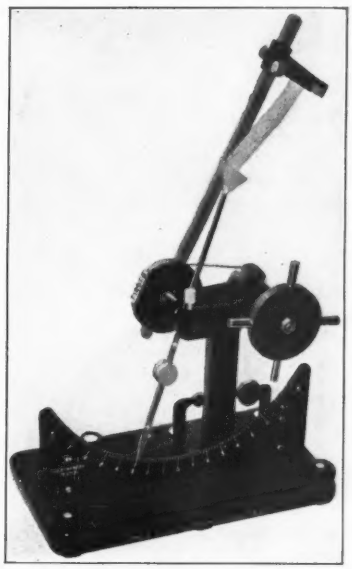
Richardson Scale Co. is constructing several huge liquid machines for similar purposes, in which Manhattan gasoline-proof products also are being used.

Stiffness Tester

THE stiffness tester is an instrument for measuring the stiffness, softness, or pliability of various materials, as rubber, paper, cloth, leather, etc. Originally designed by a paper manufacturer, it is now also used for testing fabrikoid, felts, roofing, and other materials. It consists of a balanced pointer which can be loaded with weights of various values, placed in various positions below the center. A sample is cut to standard size, clamped in the movable arm, and drawn over the top of the pointer until the bending of the sample releases the pointer. The deflection of the pointer, read on a scale at the bottom, is the measure of stiffness. The readings may be expressed in milligrams, if desired. Jewel bearings are provided for the pointer. The instrument is extremely sensitive and accurate, is simple to operate, and gives results readily reproducible. It will accommodate a very wide range of materials, including certain rubber products. The minimum reading is about 10 milligrams, and the maximum, over 100,000 milligrams. W. & L. E. Gurley.



Type HP-504-2 De Vilbiss Improved Condenser



Gurley R.D. Stiffness Tester

Extra Heavy Duty Condenser

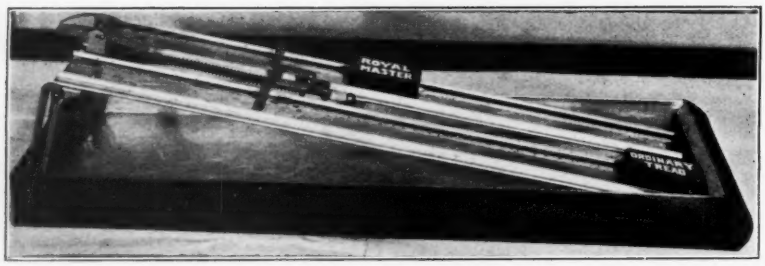
THE new improved condenser, here illustrated, effectively removes oil and water that find their way into the air line, by a baffle arrangement within the condenser and pair of filter pads conveniently located in such a way that they can be removed and replaced without disconnecting the condenser from the air line. The condenser is recommended for efficient operation at a maximum air delivery volume of 75 cubic feet per minute or less.

Air inlet and outlet are both in the top cap fastened to the body of the condenser by a companion flange. This permits removal of the body of the condenser without disturbing the air line. The filter pads, which fit snugly around the inlet tube and interior wall of the condenser tube, stop passage of any oil, water, or dirt and remain effective up to the point of saturation. The average life of these pads is approximately three months. A drain valve on the bottom of the condenser permits drainage of accumulated condensation.

The condenser is four feet, eight inches long, has a tube diameter of six inches, takes a two-inch pipe thread on inlet and outlet tubes, and has a net weight of 140 pounds. The De Vilbiss Co.

Mechanical Demonstrator

TIRE dealers are using this newly developed Royal Master mechanical demonstrator to give a dramatic and



Royal Master Demonstrator

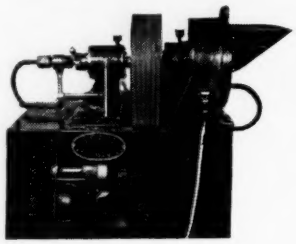
convincing exhibition of the extra safety of U. S. Royal Masters. The glass slide is lowered into the tank of water and then elevated as pictured. Two identical molded rubber blocks, with the Royal Master tread on one side and conventional tread on the other, are placed with alternate faces down at the top of the wet slide. (Tread designs do not show in the illustration as upper sides of blocks are hidden under the identification tags.) A powerful spring-controlled arm is released to drive the blocks down the slide. The conventional tread skids to the far end of the slide; while the Royal Master, with its Centipede Grip, moves only a few inches on the wet glass. This test is extremely simple but unusually effective. United States Rubber Co., 1790 Broadway, New York, N. Y.

Diaphragm Valve Motor

THE completely redesigned line of Taylor Motosteel diaphragm valves is the first to employ all-steel welded construction. This construction is lighter, stronger, and has greater resistance to shock and strains than the cast-iron type. The more powerful valve motor has a larger molded diaphragm of advanced design provided with freer access of air in starting by formed impressions in the top plate, thus insuring more effective initial force. A longer spring of larger diameter gives greater initial compression, less hysteresis, and more accurate response. The spring and its adjustment nut as well as other moving parts are readily accessible by removal of the side plates. A ball and roller bearing stem guide insures free rolling action throughout the entire stroke. A valve position indicator readily shows the valve opening. All parts are specially treated to resist corrosion. Taylor Instrument Cos., Rochester, N. Y.

"Span" Grinder

THIS American built mill is specially designed to reduce all kinds of vulcanized rubber waste to fine powder form. It is equally effective for hard rubber, chemicals, and other materials. The machine works by means of disks with special pattern of grinding surface. These disks, of a suitable alloy for abrasion resistance, are thoroughly water cooled, eliminating all excess heat during operation. The mill can run continuously, 24 hours a day, without overheating. Power required is 7½ to 15 h.p. Capacity is 200 to 500 pounds per hour, depending on the hardness of the material used and the fineness of the powder desired. The mill is adjustable to deliver any fineness of powder. Rubber dust comes out completely uniform. No screening is needed.



"Span" Grinding Mill

The machine feeds automatically, and by means of a large hopper or chute the material may be loaded in large quantities at a time. No other attention is necessary except the removal of the finished product at regular intervals. In construction this grinding mill is made of the best materials obtainable. It has New Departure ball bearings, six V-belt drive and bronze fittings.

The motor is installed under the base, making the machine a complete unit, very compact, simple in design, sturdily built for continuous long and satisfactory service. The dimensions of the machine are: 46 inches long, 42 inches high, and 22 inches wide. Weight without the motor is about 1,000 pounds. M. Pancorbo.

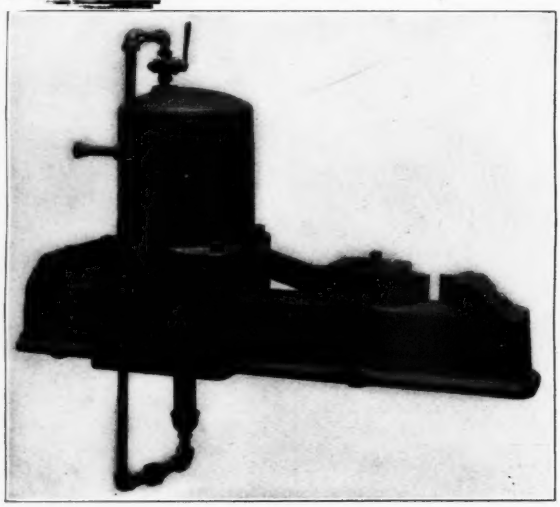
Motosteel Evenaction Valve

Bead Wire Cutter

BEAD wires of all types can be cut easily and quickly in all passenger and truck tire sizes with the new sturdy machines for this purpose produced in two sizes by the National Rubber Machinery Co., Akron, O. These machines, one for passenger and the other for truck tires, are designed to mount on a bench or table height rack. The smaller machine is 45 inches long, the latter 48 inches. Both are 12 inches wide and approximately 24 inches from base to top of air piston cylinder. They are especially adopted to the laboratory section cutting and service department needs of any tire factory.

Reference to the accompanying illustration will readily disclose the simple operating principle, which consists of a powerful chisel operated through a horizontally imposed lever by a double acting vertical air piston.

It is advisable to cut through the fabric on both sides of the bead wire at the desired points. Hang the tire, then, over cutter arm with prepared point in alinement with cutter blades. Open the upper valve to effect the powerful downward cutting stroke of the air piston. This operation may be repeated at the rate of 10 to 30 cuts per minute with a minimum of manual effort. The laborious hack saw and wire snip methods are no longer necessary with the advent of this simple sturdy device.



National Bead Wire Cutter

New Goods and Specialties

U.S. Royal Golf Ball Gift Packages

Spalding's Christmas Golf Ball Package

Satin Finish for Rubber

F-77 IS a perfected satin finish and preservative dressing for rubber and rubberized products. It becomes an essential part of any rubber surface to which it is applied, prevents unsightly bloom, and preserves its attraction of newness. The material comes in clear and black; may be applied with rag, sponge, or brush; spreads easily; and dries quickly on the surface. It adds immeasurably to the appearance of tires, running boards, and tops of automobiles, matting, stair treads. As a dressing for new rubber products such as mechanicals, molded goods, imitation leather, etc., it maintains their quality and sales appeal. Franklin Research Co., 5134 Lancaster Ave., Philadelphia, Pa.

Golf Ball Packages

WITH its eye on the Christmas trade A. G. Spalding & Bros. offers a novel and practical gift in its new golf ball package. A dozen top-grade balls are placed in a good-looking red and gold box with hinged lid that will later serve well for odds and ends. The crowning achievement of the gift, though, is the 60-page book by Bobby Jones on "Rights and Wrongs of Golf." Plentifully sprinkled with legible illustrations, it covers every department of golf and will prove very helpful to the reader. The price of this package, book and all, is said to be no more than that of a dozen of the same golf balls.

United States Rubber Products, Inc., 1790 Broadway, New York, N. Y., features four attractive gift packages in which U.S. Royal golf balls are being offered. At the left in the accompanying illustration is a solid brass humidor, ornamented with a tavern scene, containing six balls. The two packages in the center, one of six and the other 12 balls, have red, black, and gold wrappings over the regular U.S. cartons. The package at the right is a beautiful red lacquer box, which makes a splendid cigarette, jewelry, or utility container and, like the humidor, proves useful long after the gift occasion has passed. Incidentally, it will be observed that while these gift packages are ideal for Christmas, they are not definitely linked to the Christmas idea and are therefore equally appropriate for other gift occasions.

Kearney's Patented Anti-Skid Horseshoe

Anti-Skid Silent Horseshoe

ACCORDING to the author of an article entitled "Evolution of the Horseshoe,"[1] three distinct epochs in the history of horseshoes are recognized. The first, that of the hand turned iron shoe of various patterns, spans the centuries from about 500 B.C. to about 1880 A.D. The second, that of mass production of machine made shoes, from about 1880 to date. The third epoch is just beginning, marked by the recent introduction of the rubber covered machine made shoe of which the latest model is shown.

This shoe consists of drop forged steel insert with concave upper surface about the thickness of a racing plate. This insert can be prepared to receive the inseparable attachment of its rubber cover by the method known as brass plating. Briefly described, the drop forged steel shoe insert is carefully cleaned and sandblasted previous to plating. The clean brass plated surface is immediately protected by a heavy coating of rubber cement which also serves the purpose of securing strong adhesion of the rubber compound to the metal insert.

The newly patented rubber covered shoe pictured not only silences the noise of horse travel on hard pavements, but it saves the endurance of the animal by affording good traction even on wet and icy pavements.

[1] *Rider & Driver*, Sept., 1936.

Ideal for Christmas Gifts—"Compounding Ingredients for Rubber," by the Editors of INDIA RUBBER WORLD. $2.50 Postpaid in U. S. A.; $2.75 Elsewhere; Special Rates for Quantities.

Editor's Book Table

NEW PUBLICATIONS

"Witcombings." Wishnick-Tumpeer, Inc., 295 Madison Ave., New York, N. Y. The October issue of this enterprising house organ is replete with news items of interest to the rubber chemist and technologist. It also contains an informative and timely article on "Technical Sales Service," by C. R. Johnson, of the Witco technical department.

The Chemical Digest." Foster D. Snell, Inc., 305 Washington St., Brooklyn, N. Y. This four-page quarterly sheet recounts the facilities of the analytical department of this organization of chemists and engineers engaged in every form of chemical service. Included among the membership of the staff are specialists in nearly every phase of industrial technology—analysis, research, production, and management.

"Safe Motoring on American Highways." This pamphlet records what William O'Neil told John B. Kennedy on this subject in an interview broadcast over a Coast-to-Coast radio network of the National Broadcasting Company. The interview records invaluable information and advice to motorists in the interest of safety. Copies can be obtained by requesting them of the General Tire & Rubber Co., Akron, O., of which Mr. O'Neil is president.

"U. S. Royal Industrial Mountings." United States Rubber Products, Inc., 1790 Broadway, New York, N. Y. This admirable treatise is on the current engineering practice of effectually eliminating vibration in industrial mountings by carrying the load on rubber mounted in shear. The booklet is copiously illustrated with views, graphs, and sketches of type mountings.

"Schrader Catalog, 1936-1937." A. Schrader's Son Division of Scovill Mfg. Co., Inc., Brooklyn, N. Y. This catalog comprises full descriptive data as to sizes, dimensions, etc., of the extensive line of Schrader tire valves, replacement parts, tire gages, and air control devices and tools. A copy of this catalog is a necessity for all tire dealers, tire repairers, and garage men.

"The Wonder World of Chemistry." E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. In this attractively illustrated brochure are described and displayed the many applications of du Pont chemical products, substantiating the du Pont slogan "Better Things—For Better Living—Through Chemistry."

"Baldwin-Southwark." Baldwin-Southwark Corp., Philadelphia, Pa. The initial issue of this quarterly fittingly celebrates the one hundredth anniversary of Southwark's century of engineering achievement. The history is interestingly told and well illustrated by portraits of company founder, Samuel V. Merrick, his successors, and associated companies now combined as Baldwin-Southwark Corp., source of a diversified list of tools, machines, and instruments that equip and power modern industry, that assist in research and engineering construction.

"The New Jersey Zinc Activator." The New Jersey Zinc Co., 160 Front St., New York, N. Y. A discussion of the dielectric constants of rubber compounds containing zinc oxide opens the October issue of the "Activator." The second article is devoted to the microscopic study of pigment dispersions in rubber and is amply illustrated by six full pages of photomicrographs.

"Development of the Banbury Mixer." General Atlas Carbon Co., 60 Wall St., New York, N. Y. In this folder is printed a letter account by Fernly H. Banbury giving the interesting story of his invention of the rubber mixer which bears his name. This machine has earned world-wide acceptance as fundamental equipment for dustless dispersion of carbon black and other dry powders in rubber on a mass production basis.

"Industrial Floor Truck Designs," No. 225. Lewis-Shepard Co., 175 Walnut St., Watertown, Mass. This is one of the most complete showings of floor trucks for factory, warehouse, and industrial use ever included in one folder, for the interior transportation of practically any material, merchandise, or product manufactured or handled.

"McDonnell Boiler Water Level Control." McDonnell & Miller, Wrigley Building, Chicago, Ill. This illustrated, descriptive 48-page catalog covers boiler level control apparatus and special products for the safety and economy of boiler operation.

"Type 'EQ' Low Lift Platform Trucks." Elwell-Parker, Cleveland, O. This illustrated descriptive folder features the specifications of type "EQ" trucks and some of their industrial applications, also, the company's general line of trucks.

"Report on Pressure Cartridges for Hand Fire Extinguishers. November 1, 1936." Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago, Ill.

BOOK REVIEWS

"1935 Bibliography of Rubber Literature (Excluding Patents)." Compiled by Donald E. Cable, Ph.D., Technical Librarian, General Laboratories, United States Rubber Products, Inc., Passaic, N. J. Including Directory of Rubber Chemicals. Published by *The Rubber Age*, 250 W. 57th St., New York, N. Y., 1936. Price $1.

This is the first of a series of annuals designed to serve the rubber industry by a sustained bibliographic service. This plan cannot fail of appreciative support, particularly by chemists, technologists, and those engaged in rubber research.

Section I of the book comprises a list of titles covering the world literature on rubber classified in a series of 74 separate and distinct bibliographies arranged in a numbering system easily followed, permitting cross referencing and the preparation of author and subject indexes which conclude the first section.

Section II is a rubber chemical directory listing brand names of rubber chemicals and other materials commonly used in rubber compounding, classes of chemicals, and addresses of chemical concerns serving the rubber industry.

"Malavan Agricultural Statistics—1935." By D. H. Grist, agricultural economist, Department of Agriculture, Straits Settlements and Federated Malay States, Kuala Lumpur, 1936. Paper, 6½ by 9½ inches. 89 Tables. Two charts. Price 50 cents.

This is the fifth annual summary of Malayan agricultural statistics and gives data up to the end of 1935. It furnishes a useful summary of local information regarding agricultural conditions in Malaya including a résumé of rubber plantation statistics and activities.

"Here's the Answer to Your Temperature Problem." The Brown Instrument Co., Philadelphia, Pa. This new broadside graphically describes the accuracy, simplicity, and ruggedness of Brown thermometer controllers. It illustrates the ease with which Brown Air-o-Line thermometer controllers may be "tuned" to specific process requirements and also details other features and ranges of both air operated and electric types of controllers. The new broadside presents, too, a complete description of Con-Tac-Tor mercury switches.

Rubber Industry in America

OBITUARY

S. J. Peachey

FROM England comes news of the death, in London, of Stanley John Peachey, prominent rubber technologist. He was born in London 59 years ago and received his early education at the Central Foundation School there. Later he studied pure and applied chemistry at the City and Guilds Technical College. During his term as lecturer in the Faculty of Technology at the University of Manchester he first turned his attention to the problem of rubber manufacture. Apart from much work of academic interest his practical contributions to the rubber industry included "Accelerene," one of the first and most important vulcanizing accelerators with anti-aging properties, and "Duroprene," a chlorinated rubber product used as a plastic material and as an anti-corrosive varnish. One of Mr. Peachey's most interesting discoveries was the method of vulcanizing rubber by two gases, hydrogen sulphide and sulphur dioxide. This process aroused world-wide interest and is generally accepted as the ideal method for the vulcanization of rubber in thin films. It was a source of great disappointment to the inventor that the company, specially formed to establish the process on a basis acceptable to rubber manufacturers, failed in its objective. Of late years, owing to indifferent health, Mr. Peachey's interest in the rubber industry had been somewhat intermittent; neverthless his work in connection with the use of the sulphides of phosphorus as a means of vulcanization has assumed commercial importance in England and is attracting considerable interest abroad.

The deceased leaves his wife and two daughters.

Harvey J. Woodard

ON OCTOBER 7 Harvey J. Woodard, assistant sales manager, Lee Tire & Rubber Co., Conshohocken, Pa., died at Memorial Hospital, New York. His experience in the tire industry was long and varied. In 1913 he was New York branch manager of the Diamond Rubber Co., later absorbed by The B. F. Goodrich Co. Shortly after the merger Mr. Woodard became sales manager of the Knight Tire Co., Canton, O. Later he was engaged as vice president and general sales manager of Republic Rubber Co., Youngstown, O. When that property was taken over by Lee of Conshohocken, in 1922, he became identified with Lee. While there Mr. Woodard's principal contacts were

Harvey J. Woodard

concerned with railroad equipment, in which branch of the rubber industry he excelled.

He is survived by his wife, a son, and a daughter.

Henry A. Ritter

A SUDDEN heart attack on October 12 was fatal to Henry A. Ritter, 44, Philadelphia, Pa., branch manager for The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. Mr. Ritter came from Chicago to Philadelphia nearly two decades ago as representative of a rubber concern. He was an alumnus of Amherst College. His wife and their son survive. The funeral was held October 14.

Wm. S. Rowland

ON NOVEMBER 12 a sudden heart attack caused the death of William Samuel Rowland, president and a director of The Stanley Chemical Co., East Berlin, and technical director of the Stanley Works, New Britain, both in Conn. He started his career as a chemist in 1908 with Arthur D. Little, Inc., Boston, Mass. The next year Mr. Rowland joined the Stanley Works as chemical engineer and remained there until 1917. In this capacity he was instrumental in developing many processes relating to lacquer, and this work resulted in the founding of The Stanley Chemical Co., of which he was made president in 1917. During the World War the deceased was a major in the Chemical Warfare Service in Washington. Mr. Rowland also served on the directorate of New Britain Machine Co., Rogers Sash & Door Co., Rackliffe Bros., Inc., Naugatuck Lumber Co., Swift & Upson Lumber Co., Evans, Nye & Harmon, Inc., and the National Paint, Varnish & Lacquer Association of the United States. Besides he belonged to Theta Delta Chi and the Chemists Club of New York.

Mr. Rowland was a native of Baltimore and a graduate of Cornell University (Class of 1907).

He leaves his wife, two sons, and two daughters.

Funeral services were held November 14. Burial was in Fairview Cemetery.

J. T. Kennedy

JAMES THOMPSON KENNEDY, manager of the Detroit, Mich., manufacturers' division of The B. F. Goodrich Co., Akron, O., died suddenly November 4 following a heart attack. He had joined Goodrich in January, 1928, and was widely known in automotive and tire trade circles.

Mr. Kennedy was born in Rochester, N. Y., March 21, 1874, and had lived in Detroit 25 years. He was a member of the Society of Automotive Engineers, and Detroit Athletic, Bloomfield Hills Country, and Recess clubs.

A widower, the deceased is survived by two sisters, two brothers, and a niece.

A requiem high mass was sung November 7. Burial was in Mt. Olivet Cemetery, Detroit.

LEGAL

Activated Carbon Patents Upheld in Second Case

United States patents 1,497,543 and 1,497,544, covering activated vapor-adsorbent carbons and processes of manufacturing them, were again upheld in a decision handed down October 20 by Judge Barnes, in the District Court for the Northern District of Illinois. The case involved National Carbon Co., Inc., plaintiff, v. The Western Shade Cloth Co., defendant, and was brought in the interests of Columbia Activated Carbon, made by plaintiff and sold by Carbide & Carbon Chemicals Corp. The defendant was alleged to have infringed both patents by its use of activated carbon purchased in 1927 and, later, in 1933 from the American Solvent Recovery Corp., Columbus, O.

Trial of the case, lasting three weeks, was concluded October 10. During the

(*Continued on page 66*)

EASTERN AND SOUTHERN

THE year-end flow of extra dividend payments, wage increases, and bonuses that continue to pour into the hands of stockholders and employes of scores of corporations insures larger purchasing power for the Christmas shopping season than in any year since 1929.

Notable gains in business, accompanied by improved financial and banking conditions, but marked by failure of employment to keep pace, were noted in the Federal Reserve Board's commercial and industrial review of 1936, made public November 17. Figures for ten months of 1936 pointed to America's best business year since 1930, with 1923-25 levels exceeded in many cases.

All signs point to the fact that this country is definitely emerging from the depression, but is lagging far behind most leading countries of the world. In general this recovery is following closely the pattern of other post-war periods although this one has been more erratic owing in part to artificial influences. The only safe and sure way to prosperity as well as to general security is through abundant production at reasonable prices so that there may be a wide distribution of goods to all classes of the people. Perhaps never in our history has there been so much potential work necessary to provide for obsolescence and repairs neglected during the depression period as well as to meet the current needs of 128,000,000 people with strong desires for higher living standards.

One authority puts the total number of unemployed in September as 8,975,000, compared with 15,939,000 in March, 1933, and an average total of 1,132,000 in 1929.

Besides the general upward trend in business, certain industries will be stimulated by a normal seasonal activity during the months immediately ahead. Among those due for seasonal activity, if they follow their usual trend, are chemicals, confectionery, electrical machinery and supplies, explosives, knit goods, lighting equipment, manufactured gas, printing, rubber boots, shirts, collars, silverware, plated ware, slaughtering, and meat packing.

October shoe production confirmed predictions that output this year will about reach the 400,000,000-pair mark, the largest on record.

In the South industry continues to expand, with payrolls being increased substantially by the reemployment of hundreds of workers. Plans for construction of several big factories and enlargement of a group of others were announced.

One disturbing factor in the recovery picture is the maritime strike, but its effect is felt most on the Pacific Coast.

Du Pont News

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., on November 13 stated that general managers of the company's various interests "are considering upward adjustments of wage rates to meet conditions in the localities where plants are situated. New rates will go into effect as soon as these adjustments are worked out, and announcement will be made through the works councils in the various districts."

Wage increases have already been set for the following divisions: Viscoloid plant, Leominster, Mass., a 7% increase affecting 11,000 workers; du Pont Rayon Co., Richmond, Va., 7 to 10%, 3,000 employes; Old Hickory units, Nashville, Tenn., 7 to 10%, 5,500 persons; R. & H. Chemicals Dept., Niagara Falls, N. Y.; Rayon plant, Tonawanda, N. Y., 7 to 10%; New Brunswick, N. J., and Parlin plants.

Du Pont, on its radio program, "Cavalcade of America," Columbia Network, Wednesday, November 18, 8:00 to 8:30 p.m., E.S.T., presented "The Story of Rubber," briefly covering Charles Goodyear's work, the development of rubber chemicals and of the synthetic rubber, "DuPrene."[1] After the broadcast the studio audience was shown a twenty-minute sound picture, "The Wonder World of Chemistry," which depicts how natural products are converted into the many du Pont goods. The spectators were also given a booklet of the same name treating of the same subject.

Albert Frankel retired October 31 as general manager of the New York office of the R. & H. Chemicals Division. Mr. Frankel, treasurer of the Roessler & Hasslacher Chemical Co. when it merged with du Pont, had been affiliated with R. & H. activities 45 years. He has made no special plans regarding the future, but intends to devote the major part of his time in recreation and travel. He was the guest of honor at a dinner October 28 at which division heads from Wilmington, branch office managers from all parts of the country, and New York office associates attended. Milton Kutz, assistant general manager of the R. & H. Chemicals Division, presented him with a wrist watch and a desk set on behalf of the members of the New York office.

[1] Trade mark registered.

Wm. M. Morse, Editor Emeritus of INDIA RUBBER WORLD, Enjoying the Fishing in His New Boat at New Port Richey, Fla.

Foster D. Snell, Inc., consulting chemist, 305 Washington St., Brooklyn, N. Y., has added to the staff of chemists of its research laboratory John C. Bryan, formerly chemist with Wm. Grovenor, Inc.

Titanium Pigment Co., Inc., on October 31, 1936, was dissolved, and effective November 2, 1936, a new selling organization, Titanium Pigment Corp., subsidiary of National Lead Co., was organized under the laws of the state of New Jersey, to act as the sole sales agent for Titanox Pigments. Company headquarters and the eastern sales office are at 111 Broadway, New York, N. Y. The western sales office is at Carondelet Station, St. Louis, Mo. Officers of the new corporation follow: Ralph M. Roosevelt, president; C. F. Garesché, vice president; F. H. Dow, secretary-treasurer; A. L. Hoffman, assistant secretary-treasurer; I. D. Hagar, general sales manager; G. W. Corddry, eastern sales manager; and D. W. Edgerly, western sales manager. The manufacture of Titanox Pigments will be carried on by the National Lead Co., Titanium Division, operating plants at St. Louis, Mo., and Sayreville, N. J.

Industrial Rubber Corp., manufacturer of rubber products to customers' specifications, recently moved to 500 Driggs Ave., Brooklyn, N. Y.

New Jersey Zinc Co., 160 Front St., New York, N. Y., has added to its sales development staff Harry W. Smith, Jr., formerly with the publicity department of the American Gas Association's testing laboratories.

Leeds & Northrup Co., manufacturer of measuring, recording, and controlling instruments, and electric heat treating furnaces, 4901 Stenton Ave., Philadelphia, Pa., has opened a new branch office at 804 Judd Bldg., 75 Pearl St., Hartford, Conn.

Engineers' Council for Professional Development, 29 W. 39th St., New York, N. Y., on October 22 was granted by the trustees of the Carnegie Corp. of New York $16,000 toward support of the council's program for the year October 1, 1936, to September 30, 1937. Additional appropriations, totaling $3,450, have been made to the council by the Engineering Foundation. These donations will be applied directly to the advancement of the council's program for enhancing the professional status of the engineer through the cooperative support of national organizations directly representing the professional, technical, and legislative phases of the engineer's life.

U. S. Rubber News

More than one million bicycle tires were built by United States Rubber Products, Inc., 1790 Broadway, New York, N. Y., the first eight months of 1936, the first year since the bicycle passed its peak of popularity in the Gay Nineties that the production of "U.S." reached the million mark, to bring the company's all-time total production to 65,000,000 bicycle tires.

"We are indebted to the bicycle industry and the public for the fine showing this year," said Walter B. Harding, sales manager of the company's plant in Indianapolis, Ind., where it makes all its bicycle tires. "The bicycle industry is sponsoring a campaign that is renewing the public's interest in bicycle riding, and we are sharing the increased business therefrom. . . . This will be both our biggest unit and dollar year since the good old days when we turned out as high as four million tires in a year."

Asked if he believed production ever again would reach that mark, Mr. Harding said: "I think there is a good possibility. . . . More and more people are taking up bicycle riding, both for pleasure and health. This is particularly true of women. This year almost a half million women's bicycles will be made. This is more than the industry's total production three years ago."

Mr. Harding said that the "U.S." bicycle tire plant has been at capacity operation all year.

U. S. Rubber Products, oldest manufacturer of bicycle tires in this country, is the only company which has continued making such tires throughout the years without interruption. The company first started building bicycle tires in 1892.

Factory Manager C. E. Stoutenberg Presenting Sales Manager W. B. Harding with the 65,000,000th "U.S." Bicycle Tire

Walter H. Norton, factory manager of the U. S. Rubber, Naugatuck, Conn., plant, on November 13 announced an "upward revision" of wages for about 5,000 workers in the footwear plant. The amount of the increase, effective November 27, was not disclosed. U. S. Rubber on November 17 also announced wage increases for its workers in Providence, R. I.

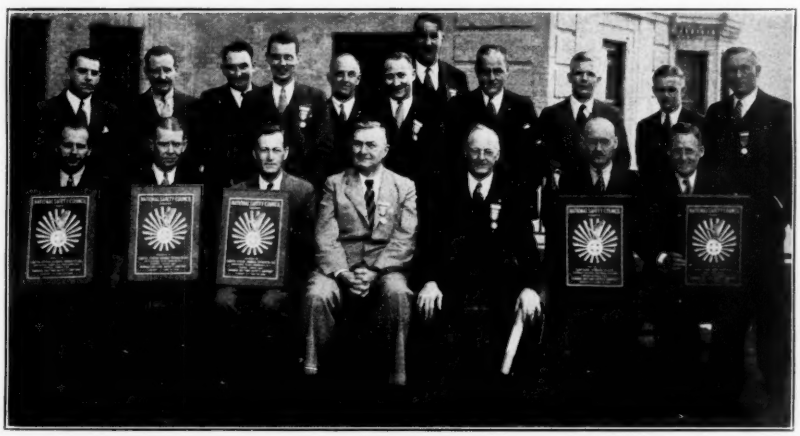
W. M. Ballew, of U. S. Rubber, recently addressed the Tulsa, Okla., Purchasing Agents Association on "Rubber Has Gone Scientific," dealing principally with the developments in rubber production and manufacturing the past decade. Also shown at the meeting was a motion picture, "Gift of the Jungle," which revealed how and where rubber is obtained.

Dunlop Tire & Rubber Co., River Rd., Buffalo, N. Y., according to a current report, has been compelled to hire about 200 additional workers because of increased tire and specialties business. Part of this improvement is due to work on the Sears, Roebuck tire contract awarded the firm earlier this year. Business volume in the company's specialty lines, as Dunlopillo rubber mattresses and sporting goods, likewise was said to be increasing. Company officials also announced that Dunlop may stock its retail stores throughout the country with automobile appliances. One executive declared an investigation of the plan's possibilities is under way, but the movement still is in its formative stages.

National Auto Show

The thirty-sixth annual National Automobile Show opened at Grand Central Palace, New York, N. Y., on Armistice Day, November 11, and lasted until November 18. This year's show, the largest yet held, fittingly climaxed one of the most critical years in automotive history. The 1937 models feature beauty, safety, and efficiency, displayed in new style ideas, greater simplicity of line, and advanced engineering control. Car interiors are redesigned to give more passenger room, greater comfort and smoother, and silent riding by more liberal use of rubber and all-over sound insulation. Much attention has been given to styling against traffic accidents. For example, in the 1937 cars the driver has a wider view of traffic and the road; an instrument board redesigned for greater convenience; better control of steering and braking, etc. Progress in rubber technology has enabled positive attachment of rubber to metal, which is largely used in the assembly of engine, chassis, and car body and the system of spring suspension to eliminate metal-to-metal contacts to do away with vibrations that loosen the connections and permit rattling.

An important new and outstanding feature of this year's show, introduced last year in a small way, was the exhibit of trailers. This new adjunct to automobiling has so extensively intrigued the interest of the touring motorist that the demand for trailers seems likely to give rise to an industrial development of great importance, since the new vehicle is fast becoming a utility factor for many purposes other than for living quarters for the motoring tourist and his family. The measure of interest in trailers is shown by the fact that in this year's show an extra floor in the Palace was required to accommodate the display of about 50 trailer models representing 24 makers.



U. S. Rubber's Delegates to the Recent N. S. C. Congress

Seated (left to right): J. E. Lovas, Safety Supervisor, Passaic, N. J.; W. C. Lingvall, in Charge of Safety, Development Dept., Passaic; O. Hopkins, Safety Supervisor, Providence, R. I.; John Roach, Deputy Commissioner of Labor, State of New Jersey, and member National Safety Council Executive Committee; E. W. Beck, Supervisor of Safety, 1790 Broadway, New York, N. Y.; F. H. Horton, Manager Personnel Dept., Montreal, Canada; R. S. Farnum, Safety Supervisor, Detroit, Mich. Standing (left to right): W. E. Bittle, Dept. Foreman, Naugatuck, Conn.; R. Gibbs, Plant Engineer, Passaic; L. Butz, Safety Supervisor, Mishawaka, Ind.; H. K. Dickinson, Safety Supervisor, Naugatuck; W. D. Stearns, Manager Industrial Relations, Passaic; W. H. Stenger, Dept. Foreman, Waterbury, Conn.; C. S. Ching, Director Industrial and Public Relations, 1790 Broadway, New York; W. C. Bowker, Plant Superintendent, Passaic; P. E. Rice, Superintendent, Naugatuck; J. J. Raytkwich, Safety Supervisor, Naugatuck; M. A. Clark, Manager Industrial Relations, Detroit

New Carbon Black Plant

A carbon black plant with a daily capacity of 70,000,000 cubic feet, one of the largest in the world, will be built in Moore County, Tex., by the recently incorporated Witco Carbon Co., 295 Madison Ave., New York, N. Y., with an office also at 832 Amarillo Bldg., Amarillo, Tex. The plant will have as a reserve the Continental Gas Co. acreage in Moore County, as well as a substantial part of the Shamrock Oil & Gas Co.'s gas acreage in the same county. The location of the plant, to cost $1,250,000, will be about a mile north of the McKee plant of the Shamrock Co., between Dumas and Sunray. Shamrock will purchase the gas production from the Continental properties in Hutchinson and Moore counties for extraction of gasoline and will in turn supply residue gas for the new carbon black plant.

Associated in the enterprise with Robert I. Wishnick, of New York, are the Continental Oil Co. and the Shamrock Oil & Gas Co.

Officers of the company follow: president, Mr. Wishnick; vice presidents, W. H. Ferguson, H. C. Fownes, II, Joseph J. Tumpeer; secretary, Ulysses S. Schwartz; assistant secretaries, G. F. Smith, H. B. Seligman; treasurer, Robert T. Wilson; assistant treasurer, G. F. Smith; directors, Messrs. Ferguson, Smith, Fownes, Wilson, Wishnick, Schwartz, Joseph J. and I. Harrison Tumpeer, and Clyde Alexander.

A.S.M.E. Annual Meeting

The annual meeting of the American Society of Mechanical Engineers will be held in New York, N. Y., November 30 to December 4, 1936. The program of papers and discussion include: Strength of Materials; Coal-Cleaning Symposium; Heat Transfer; Sugar; Safety and Hygiene in Industry; Cinder Catchers; Fluid Flow and Aerodynamics; Railroads; Oil and Gas Power; Cutting Metals; Drying Session; Power; Power and Applied Mechanics; Machinery and Springs, including rubber springs; Plant Layout Management; Hydraulics; Management; Thermodynamics; Power; Corrosion-Resistant Metals Symposium; Boiler Feed Water; Turbine History; and aviation meeting sponsored jointly by Institute of Aeronautical Sciences, Society of Automotive Engineers, and the A.S.M.E.

Vulcanized Rubber Co., Morrisville, Pa., now operates with a night shift. The company has been manufacturing combs and other hard rubber goods for more than fifty years.

Twelfth National Exposition of Power and Mechanical Engineering will be held at Grand Central Palace, New York, N. Y., November 30 to December 5. The American Society of Mechanical Engineers and the American Society of Refrigerating Engineers will hold meetings in New York the week of the exposition.

Frank G. Breyer

Election of Frank G. Breyer as president of the Association of Consulting Chemists & Chemical Engineers, 50 E. 41st St., New York, N. Y., to succeed Thomas A. Wright, of Lucius Pitkin, Inc., was announced October 28. Ralph W. Bailey, of Stillwell & Gladding, was chosen vice president, and Bernard L. Oser, of the Food Research Laboratories, secretary. Alvin C. Purdy, of Bull & Roberts, was named treasurer. Gustavus J. Esselen, William M. Grosvenor, Jr., and Preston S. Millar, of the Electrical Testing Laboratories, were elected directors for three years. Other directors of the organization are: George Barsky, of Barsky & Strauss; Professors Hal T. Beans and Arthur W. Thomas, of Columbia University; J. W. E. Harrisson, of LaWall & Harrisson; John P. Hubbell, of Singmaster & Breyer; Louis Weisberg; and Mr. Wright.

Mr. Breyer, a partner of Singmaster & Breyer, 420 Lexington Ave., New York, N. Y., was born in Baltimore, Md., December 24, 1886. He holds the B.A. and M.A. degrees from Johns Hopkins University. For seventeen years he was with The New Jersey Zinc Co., as research chemist from 1910 to 1912, chief chemist from 1912 to 1917, and chief of research and development, 1917 to 1927. He is a specialist in the metallurgy of zinc, the manufacture of pigments, paint, rubber, and plastics, and the utilization of low-grade fuel.

Mr. Breyer is the patentee or joint patentee of about fifty processes, including the basic patents on light resistant lithopone, under which the lithopone industry of the United States and part of Europe is licensed by the New Jersey Zinc Co., and the vertical retort method of smelting metallic zinc, by which tons of the metal a day are recovered without hand labor, replacing the centuries-old fire concentration method which produced a few pounds a day. He also holds patents covering the mechanization of zinc oxide furnaces and the production of extremely finely divided particles of metal oxides, particularly zinc oxide, by the blast method. Mr. Breyer, moreover, is the author of numerous technical papers and belongs to the American Chemical Society, the American Institute of Mining and Metallurgical Engineers, the American Electrochemical Society, the American Society for Testing Materials, and the American Institute of Chemists.

Filatex Corp., an affiliate of Sylvania Industrial Corp., recently was organized to make and sell a molded latex thread, known as Filatex Elastic Yarn, and also to convert it into elastic textile yarns. Executive offices are at 122 E. 42nd St., New York, N. Y.; sales offices, in charge of Morris J. Frank, are at 1450 Broadway, New York; and the plant is at Northampton, Pa. Roger N. Wallach is company president. Other executives follow: Edward D. Brown, George S. Hills, and Henry I. Peffer. The new yarn, the result of years of research and experiments, is protected by United States patents and patent applications. The plant now is in production and ready for regular deliveries.

New Research on Optical Glass

A broad program of fundamental investigations on the chemistry and physics of glass surfaces to aid in the development of scientific apparatus and ophthalmic instruments has been started at Mellon Institute of Industrial Research by the Bausch & Lomb Optical Co., Rochester, N. Y. The first studies will be concerned with the effects of environmental factors on the durability of the various types of glass used in optical instruments. This company, whose research in optical glass dates from the initial work of William Bausch in 1912, has maintained a fellowship at Mellon Institute since 1931 for research on various plant and production problems in optical technology. Dr. Frank L. Jones, the fellow since 1931, will be in charge of the company's new investigations at Mellon Institute. An enlarged staff will continue the work on plant problems at the firm's new research laboratory in Rochester. Dr. Jones received his professional education at Bucknell (B.S., 1925) and at Columbia (A.M., 1927; Ph.D., 1931).

United States Latex Imports

Year	Pounds	Value
1934	29,276,134	$3,633,253
1935	30,358,748	3,782,222
1936		
Jan.	3,733,665	474,682
Feb.	3,268,542	406,985
Mar.	3,196,083	417,704
Apr.	3,610,511	522,049
May	3,296,351	490,769
June	4,250,178	657,311
July	3,729,418	579,895
Aug.	3,944,962	602,992
Sept.	4,031,355	692,810

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

OHIO

MANUFACTURING activity in the rubber industry continues high, and rubber consumption also shows further gains.

The current year, aided also by the two increases in tire prices, promises to be the best for the tire manufacturers since 1930. Leading executives estimate that sales this year will reach 52,000,000 tires. During the first eight months of 1936 sales ran 10% ahead of last year. They totaled 38,186,200, as against 34,813,853 during the first eight months of 1935. Production has been 12% higher than in last year, but sales continued to be larger than production, resulting in a further drop in inventories. However inventories in the hands of manufacturers still were 7,793,438 tires by the end of August.

In the Cleveland district, with business continuing satisfactorily in most lines, interest was centered in the various dividend and wage increase announcements. Purchasing power here has increased more than living costs, compared with 1935. Besides employment indexes likewise rose.

Tire Prices Up

Tire manufacturers in Akron announced on November 2 and effective on that date higher prices for retail tires. The adjustments are described as including small increases and giving dealers increased margins of profits. The Goodyear Tire & Rubber Co. said increases averaged about 4%; while the Firestone Tire & Rubber Co. reported first and second line tires would be up about 4%, but the third and fourth line products would drop slightly in price. The B. F. Goodrich Co. described the changes as "adjustments." Firestone said that "on all lines, the dealers' margin of profit is increased."

This is the second price increase in the industry this year, one averaging 10% having been made effective on May 1, soon after wages were increased in most plants.

Firestone Tire & Rubber Co., Akron, has announced the resignation of Ray E. Williams, for many years employed in an advertising capacity. The company recently held a luncheon-meeting at the Hotel Hidebrecht, Trenton, N. J., presided over by John M. Bushey, of Philadelphia, Pa. The Firestone Cotton Mills, Inc., W. Gastonia, N. C., is operating on a full-time schedule.

Anchor Rubber Products, Inc., manufacturer of rubber auto mats and other accessories, 3173 W. 33rd St., Cleveland, has signed a five-year lease with option for five more for the first floor of the building at Euclid Ave. and London Rd., N. E., to cover 20,000 square feet of floor space, which more than doubles its present space. Ben Kravitz is company president.

Gysin Studio

George J. Klein

George J. Klein has resigned as head of the Raw Materials Inspection and Development Department of The B. F. Goodrich Co., Akron, to join Herron & Meyer, Inc., sales agent for General Atlas Carbon Co., 60 Wall St., New York, N. Y. He will act as technical supervisor of "Gastex" development work in the rubber industry and continue the work so successfully initiated by Dr. H. A. Winkelmann. Mr. Klein was born at Vincennes, Ind., November 10, 1902, where he attended common schools and Lincoln High School. In 1924 he was graduated from Purdue University with the degree of B.S., chemical engineering, and joined Goodrich the same year. For eight years he served as compounder of tires, tubes, and mechanical goods; then he was successively advanced to the positions of Inter-Company Service Manager and Raw Materials Inspection and Development Manager. Mr. Klein will continue to reside in Akron although the scope of his work will carry him to all parts of the country, especially to Texas, where General Atlas Carbon Co. is actively engaged in the development of improved blacks for the rubber industry. Mr. Klein is a member of the American Chemical Society.

Goodyear Plan Approved

Stockholders of The Goodyear Tire & Rubber Co. meeting in Akron November 21 approved the company's plan for the adjustment of arrearages in respect of preferred stock dividends and for the rearrangement of the company's capital stock. On November 23 the company's directors declared the plan operative. December 18 was set as the deadline for transfers, and the National City Bank of Cleveland and the Guaranty Trust Co. of New York were named agents. The plan provides for the issuance of a new senior preferred stock bearing accumulative dividends at the rate of $5 per share and carrying the privilege of conversion into common shares at the initial rate of three shares of common for one share of new preferred. The new senior preferred is offered in exchange for the present $7 first preferred at the rate of one share of new preferred and one-third share of common for each share of the old preferred stock.

I. M. Quinn, New York district manager for Goodyear, recently was made district manager for northern New Jersey and upper New York state. His office is at 500 Central Ave., Newark, N. J. Mr. Quinn has been with Goodyear 24 years. Besides his New York post he has been connected with branch offices in Pittsburgh and Philadelphia and with the factory at Akron. He has a sales organization of ten men.

Goodrich Activities

Directors of The B. F. Goodrich Co., Akron, O., at a meeting in New York November 6 approved a proposal to refinance the company's mortgage debt and to provide increased working capital through an issue of $27,000,000 of 4¼% first mortgage bonds due in 1956. Of the proceeds of the $27,000,000 of first mortgage bonds which Goodrich intends to sell, approximately $17,571,000 will be used to redeem on February 1, 1937, all its outstanding first mortgage twenty-five year 6½% gold bonds, at 107%, and the remaining proceeds will be available for general corporate purposes, including additional working capital. The management of the company considers it advisable to provide the additional funds in view of the increase in volume of the company's business and the rise in prices of its principal raw materials in recent years and the need from time to time of plant improvements and betterments. The new bonds were offered to the public November 23 priced at 101 and accrued interest, by an underwriting group headed by Goldman, Sachs & Co.

Leonard M. Freeman, manager of Goodrich's general chemical laboratories for the past five years, has been named manager of the company's raw materials inspection and development department, according to Vice President T. G. Graham. Mr. Freeman, a graduate of Miami University and the University of Illinois, joined Goodrich in 1926. He is succeeded by Dr. Robert V. Yohe, a member of the Goodrich technical staff since 1931. Dr. Yohe was graduated from Drake and the University of Minnesota. Both men are active in the Akron Section of the American Chemical Society.

W. A. Olson has been made Des Moines district manager of the Good-

rich company, according to C. B. O'Connor, general tire sales manager. Mr. Olson succeeds W. F. Geissel, assigned to other duties. Mr. Olson came to Goodrich in 1928 as a salesman in the Dallas, Tex., district. He has held a wide variety of sales posts in that district, including that of assistant district manager.

Henry O. Newman, formerly chemist with Naugatuck Chemical, Naugatuck, Conn., is now with Goodrich's mechanical goods technical department.

N. H. Keeling has been appointed manager of retail sales promotion, announced P. C. Handerson, director of advertising and publicity. Mr. Keeling comes to his new post after having served as manager of the Buffalo district of the company since 1933. He entered the rubber industry in 1915 and previous to his appointment as Buffalo district manager had been in charge of special sales promotion work and district advertising manager in the Dallas district.

John B. Shaub, executive vice president, National Rubber Machinery Co., Akron, seriously ill for several weeks, is now recuperating at his home at 766 Merriman Rd., Akron.

Acme Rubber Co., Massillon, is a new company formed by combining the assets of the Gold-Lov Rubber Co., manufacturer of rubber gloves, 429 Wayne St., Detroit, Mich., and the Hankins Rubber Co., Massillon, recently purchased at a sale by the court by a Detroit syndicate. The Hankins plant has been remodeled and renovated, and already shipments have been made of surgical, household, and industrial gloves. Acme, when in complete operation, will have in use 50 dipping machines. A. L. Loewenthal is president of the new concern, and Samuel H. Rubiner is secretary-treasurer.

Dayton Rubber Mfg. Co., Dayton, in a recent letter to stockholders reported sales for the fiscal year's first nine months ended July 31 approximated $5,000,000, about 63% ahead of the same period the previous year. The fiscal year ends October 31. President A. L. Freedlander stated comparative figures show the company is rapidly growing, and heavy expenditures are being made on improvements in the way of new machinery, more modern power plant equipment, and warehouse buildings. One of the major reasons for the increased sales volume is due to Dayton taking over the manufacture and sale of the McClaren Tire & Rubber Co.'s tires and tubes. Business as a whole continues good, and the plant is running practically to capacity. Mr. Freedlander on November 11 announced wage increases averaging 8%, totaling $150,000 annually, for 1,200 employes. The directorate also granted a week's vacation with pay for factory workers, effective January 1.

NEW JERSEY

NEW JERSEY rubber manufacturers, experiencing a very busy season, are elated over future prospects. The majority of companies operate with three shifts. Some manufacturers believe business will remain good from now on. Officials look forward to increased prices of goods because of the rise in the costs of rubber and cotton. Manufacturers and employes are preparing blanks for federal security contribution.

Wm. R. Thropp & Sons Co., Trenton, manufacturer of presses, mills, and other rubber plant equipment, has made some extensive improvements to its plant within the past few months, including the completion of a new modern and fireproof pattern shop.

Near Para Rubber Co., reports a big demand for reclaimed rubber.

The Pocono Co., Trenton, is operating overtime in some departments. Holland B. Slusser, company executive, says the business outlook is very good for his line of goods.

Essex Rubber Co., Trenton, working overtime, reports business has picked up considerably the past two months; the future is very bright for soles, heels, and mechanical goods.

Walter E. Hume, supervisor of the American Hard Rubber Co., Butler, and Bernard Shereff, of the company's standards department, were speakers at the dinner-meeting of the Northern New Jersey Chapter of the Society of Industrial Engineers on November 12 at Hotel Douglas, Newark. Mr. Hume discussed "Budgeting Steam, Power, and Water Cost in Proportion to Production Volume," and Mr. Shereff's topic was "Setting Up a Variable Budget."

General Tire & Rubber Co., Akron, will not start operations on its Wabash, Ind., plant before January 2, according to H. M. Dodge, general manager. The reason for the delay is that the necessary repairs to the recently acquired building, vacant the past nine years, will take longer than originally planned. Workmen from the Akron factory will be sent to Wabash to erect the machinery and put it in shape for operation. Production will include mechanicals and odd-size tires. In the beginning about 200 employes will be hired.

Bowling Green Rubber Co., manufacturer of molded rubber goods, 1202 Prospect Ave., Toledo, which shut down September 15 because of a strike by some of its workers, resumed operations November 2. The strike ended October 29 when an agreement was reached between the employes' com-

(*Continued on page* 64)

"Thiokol" News

Thiokol Corp., manufacturer of oil-proof synthetic rubber, Yardville, N. J., through Dr. Joseph C. Patrick, vice president, reports business shows considerable improvement. The company is operating to capacity.

Joseph Crosby, for 15 years with the Gutta Percha Rubber Co., Ltd., Toronto, Ont., Canada, recently joined the development and sales division of Thiokol Corp.

The molding of "Thiokol" ashtrays and the presentation to guests of molded "Thiokol" rubber balls were among the features which marked the opening of the current Metals and Plastics Bureau, formerly known as the Metal Products Exhibits, International Building, Rockefeller Center, New York, N. Y. The "Thiokol" booth shows a complete record of the advances made in synthetic rubber during the past five years, and examples of applications in the rubber, oil, automotive and allied industries are presented.

When the current show is over January 1, it will be supplanted by scores of permanent 1937 exhibitors, among which will be Thiokol Corp. Nine different exhibitions will be displayed in 1937, the first being that for the aviation industry, under the sponsorship of the magazine *Aero Digest.*

Puritan Rubber Co., Trenton, now operates 24 hours a day with three shifts, making rubber tiling.

Jos. Stokes Rubber Co., manufacturer of hard rubber products, Trenton, has enough orders on hand to continue its Trenton and Canadian plants running 24 hours a day.

C. Dudley Wilson, secretary-treasurer of the Luzerne Rubber Co., Trenton, was on a business and pleasure trip in the south.

Mercer Rubber Co., Hamilton Square, recently increased operations with a night shift. President William H. Sayen was on a three-week business trip in the Midwest.

Pierce-Roberts Rubber Co., Trenton, is operating to capacity in all departments, making druggists' sundries.

Whitehead Bros. Rubber Co., Trenton, with many orders on hand, now functions with three shifts in some departments and two in others.

Acme Rubber Mfg. Co., Trenton, running with two and three shifts, reports business better than in the past few years.

The Rubber Manufacturers' Association of New Jersey will hold its annual meeting and dinner at the Trenton Club, Trenton, December 8. John A. Lambert, vice president and treasurer of the Acme Rubber Mfg. Co., Trenton, is president of the association.

MIDWEST

THE wide interest shown in the new models displayed for the first time at the automobile shows gave further evidence of a large volume of orders during the coming season, as public buying power increases with the upturn in business in general.

By mid-October most major producers had their assembly lines in operation, and the production totals were moving rapidly upward. The acceleration of production was retarded to some extent by the fact that one of the three leading manufacturers did not resume the assembly of cars until the latter part of the month.

Factory shipments of automobiles and trucks by members of the Automobile Manufacturers Association totaled 216,554 units in October, 262% above the September figure, owing to the fact that 1937 models were in production. It was also 4% above October, 1935. The member companies of the association shipped about 2,780,633 units the first ten months of 1936, an increase of 24% over the corresponding period of 1935 and an increase of 76% over the five-year average for the period.

Other manufacturing industries in the Midwest were maintained at the comparatively high level that prevailed during the summer. Holiday buying, however, in some sections seems slow in developing. In the St. Louis district unemployment has been reduced by holiday demands, but relief rolls continue in formidable proportions. In Minnesota unemployment is at the lowest level since 1933; while work hours were estimated at more than double the low of three years ago.

The Eagle-Picher Lead Co., Joplin, Mo., and its subsidiary, Eagle-Picher Mining & Smelting Co., recently notified its mine, mill, and smelter workers that their wages had been advanced an average of 25¢ a day.

Lake Shore Tire & Rubber Co., S. E. 25th St. Court and Raccoon St., Des Moines, Iowa, recently completed a new addition to its plant.

N. L. Kuehn Co., 1053-55 N. Fourth St., Milwaukee, Wis., recently furnished the Milwaukee Sewerage Commission with four large steel rubber lined tanks obtained from the Goodyear Tire & Rubber Co., Akron, O. These tanks, 60 feet long and eight feet in diameter, are considered the largest tank equipment of the kind in the world for the storage of ferric chloride, which acts as a coagulant to remove water from the sludge. The chemical is delivered in rubber lined tank cars, which are placed in a heated room for tempering beneath the two large tanks, as shown in the accompanying illustration. As ferric chloride eats away almost everything but rubber, rubber linings were found essential for such tanks.

N. S. C. Rubber Section Officers

The following are the new officers of the Rubber Section, National Safety Council, 20 N. Wacker Dr., Chicago, Ill., as elected at the twenty-fifth National Safety Congress and Exposition held in Atlantic City, N. J., October 5 to 9.

General Chairman, J. M. Kerrigan, U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y.

Vice Chairman in Charge of Program, R. A. Bullock, Corduroy Rubber Co., Grand Rapids, Mich.

Secretary, R. W. Morse, Firestone Tire & Rubber Co., Akron, O.

News Letter Editor, Oliver Hopkins, United States Rubber Products, Inc., Providence, R. I.

Engineering Committee Chairman, J. G. Polm, Goodyear Tire & Rubber Co., Akron.

Health Committee, Dr. W. S. Ash, U. S. Rubber Products, Detroit, Mich.; Dr. J. Newton Shirley, Arrow Mutual Liability Insurance Co., Watertown, Mass.

Membership Committee Chairman, Paul Van Cleef, Van Cleef Brothers, Chicago, Ill.

Publicity Committee Chairman, W. H. MacKay, Dunlop Tire & Rubber Corp., Buffalo.

Statistics Committee Chairman, D. G. Welch, Hewitt Rubber Corp., Buffalo.

Members at Large, Ralph Farnum, U. S. Rubber, Detroit; John L. Grider, American Hard Rubber Co., Butler, N. J.; James Q. Lee, India Tire & Rubber Co., Akron; John J. Loge, General Tire & Rubber Co., Akron; John E. Lovas, U. S. Rubber, Passaic, N. J.; Urban L. Moler, Inland Div., General Motors Corp., Dayton, O.; W. P. Spanton, American Hard Rubber, Akron; C. W. Ufford, Ohio Rubber Co., Willoughby, O.

Past General Chairmen, E. W. Beck, U. S. Rubber, New York, N. Y.; A. M. Dietz, Pennsylvania Rubber Co., Jeannette, Pa.; C. F. Horan, Hood Rubber Co., Watertown, Mass.; J. T. Kidney, Goodyear; H. W. Low, Miller Rubber Products Co., Inc., Akron; W. L. Schneider, B. F. Goodrich Co., Akron; Charles F. Smith, U. S. Rubber Reclaiming.

Gillette Rubber Co., Eau Claire, Wis., has launched an extensive plant expansion program, according to President Ralph W. Hutchens. The company will, by the first of 1937, have increased its daily output of automobile tires by 3,000, its daily output of inner tubes by the same number, and its daily output of bicycle tires by 2,000. This will mark, Mr. Hutchens said, the largest expansion program the company has undertaken since 1928 and 1929, and the estimates of the outlay for new building, new equipment and machinery come to more than $350,000. The increased demand for tires, tubes, and bicycle tires necessitated this increase in plant facilities. Gillette's present production schedule, the largest in its history, should carry through the winter and spring and will increase as new factory space and new equipment are available. Already a large second-story addition has been made to the tire plant and machinery installed. The supplementary expansion program includes a third-story addition, 100 by 147 feet, on the present warehouse, and a second-floor addition, 62 by 200 feet, over the present stock preparation department. The present payroll, em-

Steel Rubber Lined Tanks in Building under Construction for the Milwaukee Sewerage Commission

bracing approximately 2,000 persons, runs from $225,000 to $250,000 a month. When the expansion program is completed by the first of the year, both the number of employes and the amount of payroll will be greater.

W. J. Voit Rubber Corp., manufacturer of inflated balls, Los Angeles, Calif., has opened a branch office at 180 N. Wacker Dr., Chicago, Ill., with Vernon L. Yale as branch manager.

National Sporting Goods Association will hold its seventh annual convention in Chicago, Ill., January 25 to 27, 1937.

Van Cleef Bros., maker of "Dutch Brand" rubber and chemical products, Chicago, Ill., is adding 20,000 square feet of factory floor space. The firm, founded 26 years ago, by the four brothers, Felix, Noah, Maxime, and Paul, now covers three acres of ground with its industrial plant. According to Felix Van Cleef, who with Maxime is company sales manager, the firm is one of the few in the country to give the rank and file vacations with pay, for it finds such policies increase the feeling of loyalty and contentment among workers. Van Cleef never has any labor troubles. Mr. Van Cleef further believes that the employer who has some regard for the humane treatment of his employes is a good business man. In the Van Cleef plant merit as well as length of service always calls for an increase in the wage paid a worker, and it also has a self-organized welfare club officered by employes. Paul Van Cleef is superintendent of works for the company. Noah Van Cleef is treasurer.

Chamberlain Corp., 2500 Fourth St., Waterloo, Iowa, an affiliate of the American Wringer Co., Woonsocket, R. I., will soon take up the manufacture of rubber washing machine wringer rolls, formerly made for the wringers it manufactures by the Woonsocket company. Already, according to Nicholas L. Etten, vice president and general manager, construction has started on an $80,000 plant addition, including equipment. The structure, of concrete and steel, will be 80 by 260 feet; one part 40 by 80 feet will be two stories high, the remainder one story; the floor space will total 24,000 square feet. The job should be finished around Christmas. C. Berlow, chief chemist of American Wringer, it is said, will go to Waterloo to take charge of the chemical processes involved in handling rubber. These new operations will cause the Chamberlain Corp. to hire 50 additional men beginning with the new year, and this number will be increased to 200 during 1937, adding $5,000 a week to the company payroll. At present the concern, enjoying the biggest year in its history, employs on the average 450 persons. Ultimately the American Wringer Co. intends to make in Waterloo rubber rolls for printing presses, paper mills, and other commercial plants, for the western trade.

NEW ENGLAND

MOST lines of business in New England continued active, and business men view with confidence the outlook for the next several months. Nearly all miscellaneous manufacturing concerns report volume of business, employment, and profits better than for any autumn since 1930. Cotton textiles remain active, with enough orders on hand to insure large-scale operations for many weeks. The shoe industry, however, is reasonably quiet after a very busy fall season.

Windsor Mfg. Corp., housed in the former National Acme Co. shop, Windsor, Vt., should start operations very soon in making rubber heels. Girls are being trained in trimming heels. Necessary machinery is being installed. The old plant has been remodeled to meet the demands for this new work, and the layout allows for future expansion.

The Fisk Rubber Co., Chicopee Falls, Mass., has named Critchfield & Co., Chicago, Ill., to conduct a $500,000 advertising campaign in 1937.

Archer Rubber Co., manufacturer of rubber fabrics, Milford, Mass., through President J. T. Callahan, announced that J. Frank Mitchell, for many years with the Rainwear Division of the United States Rubber Co., New York, N. Y., has joined the Archer company and will divide his time between the factory at Milford and the New York office at 45 E. 17th St.

Hood Rubber Co. is erecting an addition to Building 15, Nichols Ave., Watertown, Mass. The new unit, to be used for rubber spreading, will be of brick, wood, and steel, with a 40-foot frontage and a depth of 90 feet to cost approximately $18,000.

Goodyear Rubber Co., footwear manufacturer, has leased and is now using the former Westinghouse plant on William St., Middletown, Conn., which it is operating besides its present plant on Church St. to take care of increasing business. Goodyear Rubber, according to latest reports, now has 1,000 employes working two shifts and orders that will require full capacity for a long time to come. Holders of Goodyear stock have for some time been aware of the improvements in the company's position. Repeated inquiries for stock, it was said, found that no stock is for sale. Goodyear Rubber was taken over by Middletown residents in 1928 when a reorganization was effected by the Middletown Chamber of Commerce. Subscriptions for the stock then made were sought by residents generally, and the company then started on its own. Harold S. Guy is president of Goodyear Rubber Co.; Arthur V. McDowell, vice president; P. E. Reilly, secretary; and Charles M. Park, treasurer.

Godfrey L. Cabot, Inc., carbon black manufacturer, Boston, Mass., announced that its vice president, E. Billings, recently returned from a six-week business trip to Europe and continental European countries. F. H. Amon, the company's technical director, sailed November 11 from New York on the *Normandie*. After conducting business in England and Scotland, Mr. Amon expects to visit France, Germany, and probably Holland before returning in time to spend Christmas at home.

Arthur D. Little, Inc., research chemist and engineer, Cambridge, Mass., has added to its staff Julian M. Avery, formerly with the Union Carbide & Carbon Corp., New York, N. Y.

New England Cable Co., manufacturer of insulated wire, Concord, N. H., during the past year has expanded its production schedule to include hard rubber products. Josiah E. Fernald is company president, and S. Dunsford treasurer and general manager.

Reading Rubber Mfg. Co., Reading, Mass., is now known as Mill "R," Reading Division, a subsidiary of the Sanford Mills Corp., which acquired the Reading concern in February, 1936. Mill "R" in conjunction with Mill "L," also in Reading, produces rubber fabrics, rubberized cloth, rubber covered paper, textile and leather rolls, and pyroxylin coated materials. Executives of the Reading Division are R. D. Gale, manager; W. P. Murphy, chief chemist; and G. W. Abbott, purchasing agent and sales manager of the mechanical rubber rolls.

Converse Rubber Co., footwear manufacturer, Malden, Mass., through President Henry C. Berlin on November 17 announced wage increases for 1,500 workers, effective November 30.

United Shoe Machinery Corp., 140 Federal St., Boston, Mass., on November 24 announced a bonus of one week's pay for its 3,000 Boston employes. Besides this grant, which will amount to about $75,000, the corporation starting next year will give every employe one week's vacation with pay.

OHIO

(*Continued from page 62*)

mittee and company officials, including President Stanley Roberts. It was reported the workers had been granted a 10 to 12½% wage increase, seniority rights, and recognition of the United Rubber Workers of America. Mr. Roberts explained the wage increase had been granted before the strike and that the union recognition specified that the company would recognize a grievance committee of the union or any other group of workers who wished to form such a body.

Rubber Industry in Europe

GREAT BRITAIN

Rubber Lined Chutes

Over two years ago experiments were conducted with all-rubber (Linatex) chutes for handling coal at the Milford Docks in cooperation with the Propaganda Committee of the Rubber Growers' Association. This chute proved very successful and was loaned to an important railway company which has wide experience with equipment designed to prevent breakage of coal during loading and unloading, and the Linatex chute was found to be more satisfactory than any equipment ever tried before. These results led the London Midland & Scottish Railway to install a larger chute for its General Terminus Plant at Glasgow.

This new anti-breaker is also made of Linatex, has a diameter of three feet six inches, and can handle up to 700 tons of coal an hour. The chute consists of a light mild steel hopper, Linatex lined, to which is attached a series of flanged Linatex tubes. These tubes, one inch thick, are reenforced internally with special proofed cotton to prevent stretch. Held between the mild steel ring flanges used to attach the tubes to the hopper and to each other are the Linatex baffles, the fundamental feature of the equipment. The baffle arrangement consists of a diaphragm of Linatex one inch thick, slit to form eight sectors. Each sector is supported underneath along the center by a Linatex bracket, the metal-shod end of which projects through a slot in the wall of the Linatex tubes. In these metal-shod ends are holes through which are threaded Linatex tension cords to regulate the resistance of the baffles to the flow of coal. When necessary, an opening three feet across can be obtained to allow the passage of extra large lumps of coal.

This chute, it is claimed, reduces breakage to a practically negligible figure. A complete unit with lined hopper, three-feet-six-inch tubes, and 25 feet long, weighs less than two tons. It is simple in design, has nothing to get out of order so that no skilled attention is needed and two men can handle a complete chute. As the lower tubes are fitted with swing bolts and are therefore easily removable, the chute can be shortened and lengthened again as required. Another important advantage of the chute is that it offers minimum wind resistance. The chute is extremely durable, but accidental damage to the Linatex can be repaired on the spot by a simple cold cement. The baffles are really the only parts that may need renewal, and this can be done quickly and comparatively inexpensively. The baffles on the Linatex chute installed at Milford over two years ago still show no sign of wear.

Motor Show

The Motor Show, which closed October 24, was the last to be held at Olympia. From 1937 on these exhibitions will be held in the new and more commodious buildings being erected at Earl's Court. This latest show was particularly successful, for the number and variety of exhibits were greater than ever. As usual, a number of leading tire manufacturers exhibited.

The Dominion Tire Co., Ltd., exhibited its tires at Prince's Restaurant, Piccadilly, and sent out personal invitations to a reception and exhibition to 2,500 members of the trade as well as to about 2,000 important consumers. At the reception the visitor could listen at ease as a representative explained the construction and merits of the different items. Much interest was displayed especially in the new deskidded tire known as the Royal Master Centipede Grip,[1] the merits of which were pointed out by Sir Malcolm Campbell, Dominion chairman.

[1] See INDIA RUBBER WORLD, Mar. 1, 1936, p. 42.

Notes

Newly appointed director of Dunlop Rubber Co. is John Lyon Collyer, connected with Dunlop 14 years. An American by birth, Mr. Collyer was at one time works manager of the Dunlop factory at Buffalo; from 1928 to 1931 he was works director of the factory at Fort Dunlop, Birmingham, after which he took over the control of manufacture at headquarters.

The former director of the Rubber Research Institute of Malaya, Lt. Col. B. J. Eaton, discussed "The Future of Latex" at a meeting held under the auspices of the Manchester and District Section of the Institute of the Rubber Industry on October 19.

"Softeners in Cable Insulation" was the topic treated by J. R. MacF. Duncan and D. McQuarrie at a meeting of the Scottish Section of the I. R. I., October 21 at Glasgow.

The flexible flange on the Simplic rubber cork, put out by J. G. Franklin & Sons, Ltd., London, not only insures perfect sealing, but also perfect cleanliness. The corks, obtainable in various sizes, are intended for medicines, perfumes, hair lotion, etc.

GERMANY

The Control Bureau for Rubber and Asbestos has issued instructions, effective October 21, whereby manufacturers of tires for vehicles must keep at the disposal of the Bureau certain quantities of tires intended for covering advance requirements. At the same time manufacturers of motor vehicles and trailers have been informed that they must register the quantities of tires required for original equipment. Furthermore the manufacturers must obtain the tires for original equipment of motor vehicles and trailers from tire factories, and the vehicles may be furnished with only a sufficient number of tires. The Control Board may determine what is to be considered the adequate number.

Another order, to be enforced January 1, 1937, prohibits the manufacture, except for export, of almost 100 articles made of rubber, gutta percha, balata, rubber scrap (not vulcanized). If manufactured for export, these goods, which include gloves, bottles, bathing shoes, toy animals, balloons, shaving articles, soap containers, tobacco pouches, cigar and cigarette holders, may not be sold in Germany without permission from the Import Control Bureau.

The Adolf Pohl Gummi G.m.b.H., recently established in Berlin with a capital of 20,000 marks, is to engage in the manufacture of synthetic rubber from native products.

The gross business of the Rheinische Gummi-u. Celluloid-Fabrik, Mannheim-Neckarau, in 1935 came to 5,190,000 marks against 4,530,000 in 1934. After allowing for various charges, a balance of 420,000 marks (against 310,000) remained; the entire amount was used for amortizations so that the books closed without profit and loss for 1935.

Zieger & Wiegand, A.G., Leipzig, booked net profits of 10,743 marks in 1935, an increase over the 6,405 marks of 1934, but did not allow for the payment of a dividend.

The Dechema, German Society for Chemical Plant, is organizing the Achema VIII Exhibition of Chemical Plant, to be held in July, 1937, in Franfurt a.M. There will be included a separate "Kunststoffe" exhibition where the nature, production, manufacture, and use of artificial substances will be demonstrated.

Gummi-Zeitung on October 1, 1936, celebrated its fiftieth anniversary. A special jubilee number is to be published in the near future.

EUROPEAN NOTES

According to P. Kaplin,[1] successful experiments have been carried out at the Treugolnik laboratories to cut the curing time of ebonite from 11 hours to five hours ten minutes by the addition of 5% diphenylguanidine (calculated on the rubber). These experiments, made on large storage battery jars, follow. The temperature in the vulcanizer, brought to 135°, is maintained for one hour 20 minutes, then is reduced to 128° and kept there one hour 50 minutes; next it is raised to 131°, at which temperature vulcanization is also completed. Toward the end of the first curing period, when the temperature in the vulcanizer is 135°, the temperature of the ebonite rises rapidly to 150°, after which it quickly drops to approximately that inside the vulcanizer. Battery jars thus produced are said to be of good quality, and it is expected to extend the use of diphenylguanidine to the production of all kinds of ebonite goods.

Tire prices may be generally advanced in France. One manufacturer already raised prices 12%, starting October, 1936.

La Guttaterna was recently formed with a capital of 100,000 francs to deal in and produce plastics, derivatives of rubber and paints. Headquarters are at Courbevoie, Seine.

Soc. Européenne de Fils Elastiques, newly formed at Paris, will manufacture rubber goods, especially elastic thread. The directors of the firm, capitalized at 100,000 francs, are Andre Scheck, of St. Cloud, Roland Northorn, of London, and George Walkley, Edgeware, both in England.

Czechoslovakia, progressing with its manufacture of tires and tubes, is increasing their export. In the first half of 1936 exports of cycle tubes were 24,847, value 89,000 kronen, against 10,965, value 35,000 kronen. Cycle tires came to 13,776, value 116,000 kronen, against 3,929, value 38,000 kronen. Exports of tires for other vehicles numbered 9,112, value 1,387,000, against 2,737, value 518,000 kronen; while tubes came to 11,179, value 184,000 kronen, against 1,819, value 40,000 kronen. On the other hand the most important article of export, footwear, fell from 2,983,642 to 2,806,536 pairs, although the value rose from 16,435,000 to 19,017,000 kronen. At the same time footwear imports rose from 6,536 pairs, value 80,000 kronen, to 7,972 pairs, value 102,000 kronen. Imports of cycle tires and tubes also increased the first half of 1936, the former from 6,891, value 91,000 kronen, to 9,788, value 125,000 kronen, and the latter from 4,093, value 16,000 kronen, to 5,489, value 17,000 kronen. Imports of other tires and tubes, however, decreased, tires from 7,082, value 1,840,000 kronen, to 5,821, value 1,600,000 kronen, and tubes, from 2,959, value 112,000 kronen, to 2,401, value 79,000 kronen. Crude rubber arrivals fell from 62,400 to 37,690 quintals.

Matador Gummiwerke, Prague, Czechoslovakia, closed its past business year with a loss of 230,000 kronen. The firm has a capital of 10,000,000 kronen.

Semperit Oesterreichisch-Amerikanische Gummiwerke A.G., Vienna, Austria, reports net profits for 1935 of 175,000 against 162,000 schilling. The amount is to be carried forward.

The N. V. Hevea Fabrieken, whose main branch is at Heveadorp, Netherlands, recently opened a branch factory at Utrecht to produce surgical and sanitary goods.

Portugal increased its imports of automobile tires and tubes from 952 tons, value 14,767,000 escudos, in 1934, to 1,075 tons, value 16,588,000 escudos, in 1935.

[1] *J. Rubber Ind. (Moscow)*, Mar., 1936, pp. 303-305.

LEGAL

(*Continued from page 57*)

trial expert testimony for the plaintiff was given by Prof. A. B. Lamb, head of the Chemical Laboratories of Harvard University. Corroborative testimony was given by Col. Bradley Dewey, in charge of the Chemical Warfare Service defense activities during the World War, and Prof. W. K. Lewis, also of the Chemical Warfare Service and now head of the Department of Chemical Engineering of Massachusetts Institute of Technology. Both men testified that the activated carbon covered by the patents saved many thousand lives during the war and was an extremely valuable contribution to the American defense against gas attacks. Commercial developments since then have made Columbia Activated Carbon an essential material for many industries; it is important for use in military and industrial gas masks and for the economical recovery of solvents of widely varying kinds.

Attorneys for the parties presented final arguments October 20, and Judge Barnes immediately rendered his decision in favor of plaintiff. The court held the claims of the patents valid and infringed, and ordered the customary injunction and accounting. A similar decision in the case of National Carbon Co., Inc., v. Richards & Co., Inc., and The Zapon Co. was affirmed on August 10, 1936, by the United States Court of Appeals for the Second Circuit. In this case also the patents were held valid, and the defendants were adjudged to have infringed the claims in the use for solvent recovery purposes of a carbon made by The Barnebey-Cheney Engineering Co. without license from the patentee.

Artificial Leather Patent Not Infringed

Respro, Inc., owner of U. S. patent No. 1,411,376, issued to Roland B. Respess, on a process for the manufacture of artificial leather, sued Star Backing Co., Inc., and Knute F. Wallin in U. S. Circuit Court of Appeals for the second district before Judges L. and A. Hand and Chase. The appeal was taken from the decision of the U. S. District Court for the Eastern District of New York, where there was a decree dismissing the bill because of non-infringement. The Circuit Court after review of the case held as follows: "In view of the foregoing we hold that the patent is invalid and likewise not infringed. Accordingly the decree is affirmed with costs to the defendant and the cause remanded with directions to dismiss the bill."

Supreme Court to Review Texas Carbon Black Ban

The United States Supreme Court has agreed to review the decision of a lower federal court holding constitutional a Texas gas conservation law restricting the manufacture of carbon black. The law prevents carbon black manufacturers in the Panhandle field from using sweet gas as a raw material and requires the use of sour gas. Sweet gas is suitable for household use, whereas sour gas is not, but it is declared that sour gas is suitable for carbon black production. The Texas law was attacked on several constitutional points, but was held to be valid. The appeal is brought by the Henderson Co. and the Portland Gasoline Co.

High Tariff Upheld on Japanese Shoes

Judge William A. Graham, of the Court of Customs and Patent Appeals, on November 2 upheld the constitutionality of the Tariff Act of 1930 under which a tariff was proclaimed against Japanese rubber-soled canvas footwear. His decision affirmed a previous ruling by the customs court against the Japan Import Co.

Judge Graham upheld a decision that under the Hoover proclamation of 1933 the appraisal of rubber-soled shoes imported from Japan should be made on the basis of American prices to equalize the difference between "the cost of production of domestic rubber-soled footwear and foreign production of like or similar footwear."

The importing firm contended that the shoes should have been appraised at the export value.

Court records disclosed that the shoes, or "sneakers," imported in 1933 in New York, were entered at from 8.8 to 14¢ per pair. They were appraised at unit prices of from 59 to 69¢ per pair less 10% and 5% discounts.

"Annual News Letter, All Industrial Sections, October, 1936." National Safety Council, Inc., 20 N. Wacker Dr., Chicago, Ill.; Industrial Accident Prevention Associations, 600 Bay St., Toronto 2, Canada. Valuable records and suggestions are given for preventing accidental injuries and impairment of the health of industrial workers.

Rubber Industry in Far East

MALAYA

Research Results

Although the staff of the Chemical Division of the Rubber Research Institute of Malaya was below strength the greater part of 1935 and research activities had to be restricted, the annual report for 1935 showed much interesting work could be embarked on in the latter part of the year after two newly appointed officers, J. H. Piddlesden and Dr. K. C. Roberts, had arrived in Malaya.

Most of the work undertaken during the year concerns latex. Mention has already been made of the important investigations on latex constituents undertaken by Dr. Roberts. Regarding the putrefactive odor in preserved latex, it has so far not been possible to develop a simple test, but experiments confirm the opinion earlier expressed that 0.70 to 0.75% of ammonia should be regarded as the minimum amount for safe preservation. Attention is further called to the dangerous possibility of the development in the latex factory of strains of bacteria with superior resistance to ammonia, and periodical disinfection of all utensils, floors, drains, with a tar-acid disinfectant is advised.

Nor has it been possible to devise a perfectly satisfactory stability test. At present two different pieces of apparatus, recently obtained, are being used to explore stability variations and, if possible, to discover the causes of variation.

The question of finding a good non-alkaline disinfectant-preservative for latex has also received attention, and various proprietary and non-proprietary compounds have been tested. So far this work has not been very successful. Thus while in some respects mercuric cyanide seemed to answer requirements, it cannot be recommended because of its highly poisonous nature. Hower, where very high stability is desired and the products are not used in circumstances likely to cause poisoning, latex preserved with mercuric cyanide may prove of interest. A trial shipment of latex preserved with 0.1% mercuric cyanide plus 0.1% ammonia arrived at the laboratories of the London Advisory Committee in good fluid condition, though somewhat discolored, and the latex proved exceptionally stable.

Work in the preparation of rubber with water absorption properties low enough to interest electrical industries was continued. Numerous tests made during 1935 indicate that in general rubbers having low nitrogen content will also show low water-absorption; experiments have mainly centered round the enzymic decomposition of the nitrogenous constituents of latex by means of the enzyme papain. In the second half of 1935, rubbers, which in Malaya gave low water-absorption, were sent to the London Advisory Committee, which confirmed the Malayan results. Now a larger consignment will be prepared which an interested cable manufacturer will subject to electrical examination.

The effect of varying the amount of coagulant, the degree of dilution, and degree of soaking of the coagulum before machining, on the plasticity of air-dried and smoked sheet, has been systematically studied with a view to obtaining a softer rubber. It is interesting to note that some unusually soft rubbers were obtained in the course of the experiments on rubber of low water-absorption referred to in the above paragraph.

Notes

Singapore rubber remillers, already hard hit by the growing tendency of natives in Netherland India to ship a better quality of rubber, now stand to lose still more business as the efforts of the Dutch authorities to improve the native product become increasingly successful. The modification of the special export duty the latter part of September, when the allowance for wet rubber was discontinued, will have the effect of still further decreasing the proportion of wet rubber in the shipments to Singapore. Hitherto the dry rubber content of "wet" rubber was calculated at 90%, but the Dutch authorities have found that the so-called wet rubber really had a higher dry rubber content, giving exporters of this type of rubber a small advantage, and now this allowance has been stopped. Incidentally, this modification serves a double purpose: the natives are further encouraged to export their rubber in a finished state, and control of shipments is facilitated; this will be of especial importance when individual restriction for the natives in Netherland India is introduced early in 1937.

Valuable testing apparatus and machinery, in addition to irreplaceable records containing the results of nine years' research, were destroyed when a fire broke out recently at the Rubber Research Institute at Kuala Lumpur. The chemical and soils apparatus, the factory and two offices where the records were kept were destroyed. The cause of the fire has not yet been discovered. The Institute was to have moved to new buildings now under construction and expected to be ready in a few months.

The Federated Malay States Government has issued a notice requiring that all cases, bales, bags, or other packages containing rubber for export must be clearly marked in English letters with the name and address of the dealer who packed it together with the number of his license, or the name and address of the producer, if packed by him. This measure has been adopted to stop the practice of certain packers of putting less rubber in the packages than indicated on the outside. Frequently this discrepancy has passed unnoticed, but, when discovered, the packers concerned have made good the difference.

The method of calculating the rubber cess and the export duty in Malaya has been changed as from October 1, 1936. Formerly a cess of 0.7-cent per pound of dry rubber was imposed, a part of which was export duty while the remainder went to a rubber fund for meeting the cost of the administration of the Rubber Regulation Enactment, and for research, including the maintenance of the Rubber Research Institute. Now a separate export duty on a sliding scale and at an ad valorem rate is levied. When the price is under 20 Straits cents a pound, the export duty is one cent per pound; when it is 20 to 22 cents, 1½ cents per pound; 22 to 24 cents, 1¾ cents; 24 to 26, two cents; 26 to 28 cents, 2¼ cents; 28 to 30 cents, 2½ cents; 30 to 35 cents, three cents; and over 35 cents, 3¼ cents. For the contribution to the Rubber Fund, a cess of 0.5-cent per pound is imposed.

The preparation of first grade pale crepe appears to be decreasing, said Colonel Eaton, former director of the Rubber Research Institute of Malaya, in his report for 1935. This is chiefly due to the use of latex in the manufacture of many articles for which thin crepe was formerly used. The preparation of smoked sheet with modern equipment in the form of line-ahead sheeting machines and with flooding or other methods of conveying the coagulum from the coagulating tanks to the battery is the most economical method of preparing raw rubber, he continued. It is extremely improbable, he considers, that crumb rubber can be made as cheaply as sheet rubber.

NETHERLAND INDIA

Better Business

A wave of optimism is sweeping Netherland India now that the Netherlands has at last also abandoned the gold standard. The planting industry as a whole has long favored such a move as practically all sections have hitherto been at a disadvantage in world markets as compared with their colleagues in British territory, because the Dutch were still on the gold standard. This, too, was one of the chief reasons why Dutch rubber producers generally profited less than the British from the restriction scheme; relatively fewer were able to pay dividends, and they were worse off during the slump, as the far larger percentage of estates out of tapping at the time indicated.

Now their condition has been vastly improved overnight. Rubber, which was selling around 27 guilder cents a pound, immediately went up to 32 cents; while, naturally, rubber for future delivery secured still better prices. It is possibly too late for the effect of the improved condition to be noticed in the 1936 accounts, especially as the larger concerns had already sold forward most of their 1936 crop. Of course where producers were lucky enough to make their contracts payable in English currency, substantial profits must have been reaped. In any case, since prices had been improving even before the devaluation of the guilder, Dutch rubber producers will make a better showing for 1936, and the number once more able to pay dividends will no doubt be considerably increased. Add to all this that costs have been kept very low and are not expected to be much affected by the new condition, at least for the near future, and the optimism is understandable.

The Dutch rubber producers benefit in another direction. The duty on estate rubber shipped from Netherland India is fixed annually; for 1936 it is one cent per half kilo, based on the average price of July 1, 1934, to June 30, 1935; for 1937 the duty will be calculated on the average price for the period July 1, 1935, to June 30, 1936, and will be 1¼ cents so that no substantial increase in these duties is as yet provided for until 1938, when the 1936-1937 prices will form the basis.

Of course all the export crops produced here will feel the good effects of the higher prices due to the devaluation. Government finances also will improve so that Netherland India looks forward to a period of prosperity, nothing so unsettling as a boom, but a wholesome, beneficial, and general lifting of conditions.

Forward Sales

In connection with the above it is worth noting some forward sales evidently entered before the devaluation.

The Sumatra-Rubber Cultuur Mij. sold forward out of crop 1936 a further 657,900 half kilos at an average of 28 guilder cents, so that now a total of 1,252,626 half kilos have been sold by this concern out of the 1936 crop, the gross average price being 27⅛ guilder cents. It also sold out of crop 1937, 367,200 half kilos standard crepe at 8 3/16d. per pound, c.i.f.

The Nederlandsch-Noorsche Plantage Mij. sold forward out of crop 1936 an additional 303,812 half kilos at an average of 27½ cents per half kilo, c.i.f., bringing the total sold forward out of crop 1936 to 549,452 half kilos at an average price of 26¾ cents. The forward sales out of crop 1937 included 183,600 half kilos standard sheet at 8d. per pound, c.i.f., and 122,400 half kilos at 27½ cents per half kilo.

Kali Tello sold forward out of 1936 crop about 760,000 half kilos at an average net price of 23½ cents per half kilo, f.o.b., Soerabaia.

Native Rubber

In consequence of the immediate and considerable rise in the price of rubber locally the special export duty on native rubber, increased by one guilder to 37 guilders per 100 kilos, on September 23, was raised to 47 guilders on September 30, increased again to 48 guilders on October 1, to 50 guilders on October 4, to 51 guilders on October 11, but decreased to 50 guilders on October 20. It is considered that this duty is rather excessive, even taking into account the higher prices, but in this move is seen the aim of the government to remain master of the native rubber situation.

Exports

The provisional figures for rubber exports from Netherland India totaled 22,699,076 kilos for September, 1936, a considerable decrease as compared with the final figures for August, 25,710,636 kilos. From estates in Java and Madoera exports came to 4,617,258 kilos, against 5,070,531 in August; the September shipment included 7,431 kilos in the form of manufactured goods. Estate rubber from the Outer Provinces accounted for 7,604,258 kilos, against 8,675,567 kilos, of which 893,843 kilos, against 852,826 kilos were latex. Native rubber shipments also decreased and were 10,477,560 kilos dry against 11,948,365 kilos.

Gutta Percha Leaf to Holland by Airplane

Advantage has been taken of the excellent Dutch airplane service between Netherland India and Holland—the trip Bandoeng-Amsterdam is made in four to six days—to send a shipment of gutta percha leaf to the laboratory at Delft, Holland. This leaf comes from the Government Gutta Percha Estate Tjipetir and will be used in an investigation into the changes which take place in gutta percha leaf during prolonged storage, a question that is not only of scientific, but also of technical importance.

JAPAN

The world is becoming accustomed to Japanese efficiency; so it can cause little surprise to learn that Japan now produces almost all kinds of rubber articles except highly technical goods. A recent note in *Commerce Reports* shows that the country is now in a position to satisfy practically all her needs in rubber packing for machinery. The government helps the industry not only by specifying domestic packings for all government purchases, but by raising the import duty so that it is now almost impossible for a foreign firm to get any worthwhile orders from Japan. The United States still annually sends about $25,000 worth of quality packing, but it is not likely that this amount will be increased. Not only do the Japanese manufacturers produce all kinds of industrial packing, but two leading firms export a wide variety of these products.

However, if Japan is making headway in certain directions, she is losing business in others. As a result of the production of tires in Netherland India, imports from Japan have been decreasing; and since the Goodyear factory is now also producing 2,000 cycle tires and 2,000 tubes daily, with the intention of increasing this amount to 3,500 shortly, the imports are due to drop still further. This decline Japan will feel all the more keenly as Netherland India was formerly her best customer for tires, taking about half the total Japanese exports of these goods. In 1934, Japan sent to Netherland India 50,900 piculs, value 3,323,000 yen; in 1935 this figure dropped to 45,000 piculs, value 2,980,000 yen, although exports had actually continued to increase during the earlier months of 1935, the value for the first four months having been 1,066,000 yen against 874,000 in the same period of 1934. Quite evidently production in Netherland India effectively checked the growing Japanese business toward the latter part of 1935; the value of the exports during the first four months of 1936 showed a still greater drop, to 646,000 yen.

Japan has also lost considerable ground in various markets for footwear, not only in western countries, but also in the East. She seemed to

(*Continued on page* 76)

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

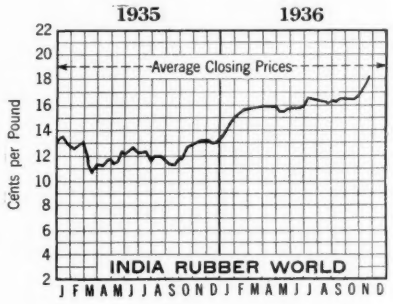
Futures	Sept. 26	Oct. 31	Nov. 7	Nov. 14	Nov. 21
Oct.	16.37	.....	.....	.....	.....
Nov.	.....	17.09	17.48	17.82	18.06
Dec.	16.47	17.12	17.50	17.85	18.08
Mar.	16.59	17.15	17.59	17.90	18.14
July	16.77	17.19	17.69	17.97	18.17
Sept.	.....	17.27	17.71	18.01	18.18
Oct.	.....	.....	17.74	18.04	18.19
Volume per week (tons)	5,730	9,640	8,840	8,610	8,820

New York Quotations

New York outside market rubber quotations in cents per pound

	Nov. 25, 1935	Oct. 26, 1936	Nov. 25, 1936
Paras			
Upriver fine	13¼	21	22½
Upriver fine	*15¾	*25	*26½
Upriver coarse	9	12	12½
Upriver coarse	*12½	*17	*18¼
Islands fine	13¾	21	21½
Islands fine	*15¾	*25	*26
Acre, Bolivian fine	13½	21½	22¾
Acre, Bolivian fine	*16	*26	*26¼
Beni, Bolivian	13¾	22	23
Madeira fine	13¼	21¼	22½
Caucho			
Upper ball	9	12	12½
Upper ball	*12¼	*17	*18¼
Lower ball	8½	11½	12¼
Pontianak			
Bandjermasin	6½	6	7
Pressed block	13½	10/20	10/20
Sarawak	6½	6	7
Guayule			
Duro, washed and dried	12	13¼	13¾
Ampar	13	13¾	14
Africans			
Rio Nuñez	15	15	16¾
Black Kassai	15	15¼	16¾
Prime Niger flake	25	27½	27
Gutta Percha			
Gutta Siak	12½	10½	10½
Gutta Soh	13	14½	12½
Red Macassar	1.25	1.10	1.10
Balata			
Block, Ciudad Bolivar	30	30	32
Manaos block	28	25	25
Surinam sheets	33	33	32
Amber	36	38	36

*Washed and dried crepe. Shipments from Brazil.



New York Outside Market—Spot Ribbed Smoked Sheets

THE table to the left shows prices of representative future contracts on the New York market during approximately the last two months.

A strong upward movement of prices has featured the market for rubber which followed the increase in the rubber quota to 70% set October 27 by the International Rubber Regulation Committee. Stimulated by the strong Continental demand in London and decline of world stocks, the price of ribbed smoked sheets reached 17⅝¢ on November 2 and passed the 18¢ level November 16. The advance was further stimulated by announcement that the export duty on native rubber will be advanced to 56 guilders per 100 kilograms for sheets effective November 30 and for blankets December 18. Crepes continued to command high premiums, being quoted at 1/16 to 7/8¢ over standard sheets. The market became somewhat hesitant over the probability of whether the I.R.R.C. would again raise the quota in view of the large demand now in evidence.

New York Outside Market

Factory buying interest was of only fair proportions early in November when the new high of 17 3/16¢ was reached for ribbed smoked sheets. It remained only moderate as the price rose steadily to 17 15/16¢. Beyond that level factory buying became active for a few days, then suddenly grew less keen as the price reached 18¼¢ November 19. On November 25 demand was very active at 18⅜¢.

Week-end closing prices on No. 1 ribbed smoked sheets follow: October 31, 17 1/16¢; November 7, 17 9/16¢; November 14, 17⅞¢; November 21, 18 3/16¢.

U. S. Crude and Waste Rubber Imports for 1936

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1936	Totals 1935	Balata	Miscellaneous	Waste
Jan. ..... *tons*	29,130	1,263	597	167	65	70	..	31,292	42,059	20	870	122
Feb.	33,203	1,146	550	217	28	75	..	35,219	35,383	95	665	184
Mar.	35,675	1,296	390	35	15	40	..	37,451	44,041	60	620	142
Apr.	38,286	1,324	559	75	21	105	..	40,370	43,545	167	1,013	456
May	34,048	1,033	342	79	10	86	..	35,598	26,766	146	391	224
June	39,900	1,531	226	58	20	97	..	41,835	38,340	88	662	126
July	34,277	1,244	233	25	6	96	..	35,881	46,880	66	821	95
Aug.	40,742	1,486	50	126	12	146	..	42,562	38,655	142	523	155
Sept.	46,515	1,394	210	80	81	106	..	48,386	34,569	98	514	212
Oct.	38,508	1,980	175	42	101	114	..	40,920	34,356	21	462	149
Total, 10 mos., 1936 .....*tons*	370,284	13,700	3,332	904	359	935	..	389,514	.....	903	6,541	1,865
Total, 10 mos., 1935 .....*tons*	370,029	9,328	4,010	638	229	360	..	.....	384,594	623	4,913	218

Compiled from The Rubber Manufacturers Association, Inc., statistics.

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	October, 1936						November, 1936														
	26	27	28	29	30	31	2	3*	4	5	6	7	9	10	11*	12	13	14	16	17	18	19	20	21
No. 1 Ribbed Smoked Sheet	16 7/16	16¾	16¾	16¾	17	17 1/16	17⅛	..	17½	17 7/16	17 7/16	17 7/16	17½	17¾	..	17⅝	17¾	17 7/8	18 1/16	18¼	18¼	18¼	18¼	18 3/16
No. 2 Ribbed Smoked Sheet	16⅜	16 11/16	16 11/16	16 11/16	16 15/16	17	17 1/16	..	17 7/16	17⅜	17½	17½	17 7/16	17 11/16	..	17 9/16	17 11/16	18	18 1/16	18 3/16	18 3/16	18 3/16	18 3/16	18 5/16
No. 3 Ribbed Smoked Sheet	16 1/16	16⅝	16⅝	16⅝	16 7/8	16 15/16	17	..	17⅜	17 7/16	17 7/16	17 7/16	17⅜	17⅝	..	17½	17⅝	17¾	17 15/16	18⅛	18⅛	18⅛	18⅛	18 1/16
No. 4 Ribbed Smoked Sheet	16 1/16	16⅝	16⅝	16⅝	16 7/8	16 15/16	17	..	17⅜	17 7/16	17 7/16	17 7/16	17⅜	17⅝	..	17½	17⅝	17¾	17 15/16	18⅛	18⅛	18⅛	18⅛	18 1/16
No. 1 Thin Latex Crepe	17⅛	17½	17½	17⅜	17⅝	17 11/16	17¾	..	18⅛	18 1/16	18 1/16	18 1/16	18¼	18½	..	18⅜	18½	18⅝	18 13/16	19	19	19	19	18 15/16
No. 1 Thick Latex Crepe	17⅛	17½	17½	17⅜	17⅝	17 11/16	17¾	..	18⅛	18 1/16	18 1/16	18 1/16	18¼	18½	..	18⅜	18½	18⅝	18 13/16	19	19	19	19	18 15/16
No. 1 Brown Crepe	16⅜	16 11/16	16 11/16	16 11/16	16 15/16	17	17⅛	..	17 7/16	17⅜	17½	17½	17 7/16	17 11/16	..	17 9/16	17 11/16	17 13/16	18	18 1/16	18⅛	18 1/16	18⅛	18 1/16
No. 2 Brown Crepe	16 1/16	16⅝	16⅝	16⅝	16⅞	16 15/16	17	..	17⅜	17 7/16	17 7/16	17 7/16	17⅜	17⅝	..	17½	17⅝	17¾	17 15/16	18⅛	18⅛	18⅛	18⅛	18 1/16
No. 2 Amber	16⅜	16 11/16	16 11/16	16 11/16	16 15/16	17	17 1/16	..	17 7/16	17⅜	17½	17½	17 7/16	17 11/16	..	17 9/16	17 11/16	17 13/16	18	18 1/16	18⅛	18 1/16	18⅛	18 1/16
No. 3 Amber	16 1/16	16⅜	16⅜	16⅜	16⅞	16 15/16	17	..	17⅜	17 7/16	17 7/16	17 7/16	17⅜	17⅝	..	17½	17⅝	17¾	17 15/16	18⅛	18⅛	18⅛	18⅛	18 1/16
No. 4 Amber	16 1/16	16½	16½	16½	16¾	16 15/16	16⅞	..	17¼	17 7/16	17 7/16	17 7/16	17¼	17½	..	17⅜	17½	17⅝	17 15/16	18	18	18	18	17 15/16
Rolled Brown	15 15/16	16¼	16¼	16¼	16½	16 7/16	16⅝	..	17	16 15/16	17 7/16	17 7/16	17	17¼	..	17⅛	17⅛	17¼	17 7/16	17⅝	17⅝	17⅝	17⅝	17 7/16

*Holiday.

RECLAIMED RUBBER

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption % to Crude	U. S. Stocks*	Exports
1934	110,010	100,597	22.3	23,079	4,737
1935	122,140	113,530	22.9	25,069	5,383
1936					
January	11,665	10,039	20.7	26,145	572
February	10,188	7,366	20.0	28,267	455
March	10,712	8,767	20.5	29,161	591
April	11,382	10,333	19.9	22,274	589
May	11,512	10,396	20.6	22,852	635
June	11,935	11,548	21.9	22,738	596
July	12,330	11,816	24.6	22,602	633
August	12,856	10,993	23.6	23,750	617
September	12,959	11,170	24.1	24,950	582
October	14,737	12,606	25.5	26,389	...

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.—Public Warehouses, London, Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net) Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1934	469,484	453,223	355,000	47,644	134,927	62,142	1,019,200	964,500	681,362
1935	448,116	491,544	303,000	39,094	164,295	28,304	872,722	931,278	586,282
1936									
January	31,292	48,506	285,054	43,870	162,107	31,195	62,720	66,138	566,852
February	35,219	36,746	282,902	46,532	157,028	38 421	64,019	60,030	569,550
March	37,451	42,703	276,823	58.935	147,712	29,322	69,252	61,478	548,721
April	40,365	51,897	264,228	47,678	140,404	32,200	60,030	70,763	524,655
May	35,600	50,482	248,317	48,860	130,590	26,687	68 837	64,602	499.116
June	41,802	52,636	245,886	47,228	122,285	28,260	66,478	62,273	490,933
July	35,847	48,127	234,498	60,343	113,386	29,493	83,862	67,586	488,073
August	42,563	46,657	229,056	63,597	108,215	28,289	71,174	70,025	466,302
September	48,386	46,330	228,477	62,240	103,962	26,936	72,829	.....	458.192
October	40,920	49,509	219,553	67,825	.....	.....	.....	.....	.....

* Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, and afloat.

CRUDE rubber consumption by United States manufacturers for October, 1936, is estimated at 49,509 long tons, which is a 6.9% increase over the September figure of 46,330 long tons, and 18% above the October, 1935, revised figure of 41,969 long tons, according to the R.M.A.

Crude rubber imports for October totaled 40,920 long tons, 15.4% under the September figure of 48,386 long tons, but 19.1% over the 34,356 long tons imported in October, 1935.

The estimated total domestic stocks of crude rubber on hand October 31 were 219,553 long tons, against September 30 stocks of 228,477 long tons and 322,857 (revised) long tons on hand October 31, 1935.

Crude rubber afloat to United States ports on October 31 is estimated at 67,825 long tons, compared with 62,240 long tons afloat September 30 and 49-913 long tons afloat October 31, 1935.

PRODUCTION and consumption tonnage for October showed a very substantial increase over the corresponding figures for September. October production and consumption registered increases of 45% and 70% respectively over corresponding figures of last February, when records on reclaim were at the low for this year. The ratio of reclaim consumption to crude rubber has also advanced and has been hovering around 24% monthly for the past four or five months.

Reclaiming plants are operating very steadily to meet the increased demand of rubber goods manufacturers stimulated by the needs of the automotive industry and accessory rubber products and demand for mechanical rubber goods by general industry.

The only change in quotation on standard reclaims is an advance of ⅛¢ on mechanical blends.

New York Quotations

November 25, 1936

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	5⅜/ 5⅝
Acid	1.18-1.22	6¼/ 6½
Shoe		
Standard	1.56-1.60	6½/ 6¾
Tube		
No. 1 Floating	1.00 -	16 /16¼
Compounded	1.10-1.12	7¾/ 8
Red Tube	1.15-1.30	7¾/ 8¼
Miscellaneous		
Mechanical Blends	1.25-1.50	3⅞/ 4½
White	1.35-1.50	11¼/11½

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
Oct. 31	40,806	55,867
Nov. 7	39,845	54,286
Nov. 14	39,510	53,678
Nov. 21	39,050	52,518

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Philippines and Oceania Total	Philippines and Oceania	Africa	South America	Mexican Guayule	Grand Total
1934	467,400	379,400	79,100	6,500	6,300	11,100	17,700	17,700	19,600	1,004,800	1,400	3,500	9,100	400	1,019,200
1935	417,005	282,858	54,316	9,054	4,914	8,885	19,465	28,327	28,677	853,501	1,537*	5,031	12,194	459	872,722
1936															
Jan.	26,637	20,778	4,178	419	874	938	2,317	1,665	2,449	60,255	105	494	1,796	70	62,720
Feb.	19,692	27,991	3,664	871	511	529	2,107	3,663	2,894	61,922	225	620	1,177	75	64,019
Mar.	34,597	19,403	4,336	750	574	342	1,848	2,966	2,553	67,369	133	535	1,175	40	69,252
Apr.	21,667	25,255	3,172	413	817	869	2,053	1,596	2,416	58,258	92	533	1,044	103	60,030
May	34,108	22,121	2,560	632	485	517	2,354	2,077	2,281	67,135	103	493	1,018	88	68,837
June	25,115	26,401	3,766	673	553	461	1,386	3,737	2,733	64,825	153	456	947	97	66,478
July	34,214	33,911	3,773	1,048	323	1,035	1,399	3.734	2,738	82,175	155	423	1,013	96	83,862
Aug.	30,253	25.289	4,009	688	121	656	2,541	3,284	3.017	69,858	150*	450*	569	147	71,174
Sept.	34,160	22,334	5,390	609	76	537	1,139	3,259	3,505	71,099	150*	500*	1,070	100*	72,829

*Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

COMPOUNDING INGREDIENTS

CARBON BLACK. Despite the fact that the taxes levied on the main producing fields have caused considerable concern, no major changes have been made in price schedules for next year. The regular grades in carload quantities will be booked at present schedule prices. Because considerable difficulty has arisen in the transportation of small lots of black in bags a change has become necessary in less than carload schedules. Regular rubber grades will still be available at present prices f.o.b. warehouses wherever available, but where delivery is required an extra charge of ½¢ per pound is added. The black packed in cases or cartons will continue on a delivered basis without change in price. No doubt plenty of black will be available to meet any requirements that may develop during 1937; therefore no material changes are contemplated.

LITHARGE. Prices have been strengthened by advances in pig lead. Increases for litharge of ¼¢ per pound were reported on November 2 and again ⅛¢ per pound on November 9.

LITHOPONE. Demand is routine. Prices were cut November 9 ¼¢ a pound.

RUBBER CHEMICALS. No marked change has taken place with respect to accelerators and antioxidants. Current business is being maintained at a very high level, which is unusual for this time of year. No information regarding the price situation for 1937 will be known until the matter is definitely decided by December 15.

RUBBER COLORS. Prices are very firm. Metallic chemical ingredients are subject to advancement.

RUBBER SOLVENTS. Demand is active. Prices are steady and unchanged.

STEARIC ACID. Demand is fairly active, and prices steady and unchanged.

TITANIUM PIGMENTS. Effective November 1 prices were revised downward. Demand continues good.

ZINC OXIDE. Demand is well sustained; prices are firm.

New York Quotations

November 25, 1936

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered	lb.	$0.02¼/$0.03½
Rottenstone, domestic	lb.	.03 / .03½
Silica, 15	ton	38.00
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.07½
Accelerators, Organic		
A-1	lb.	.24 / .28
A-5-10	lb.	.33 / .36
A-10	lb.	
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
A-77	lb.	.46 / .55
Accelerator 49	lb.	
808	lb.	
833	lb.	
Acrin	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C-P-B	lb.	
Captax	lb.	
Crylene	lb.	
Paste	lb.	
D-B-A	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	
D.O.T.T.U.	lb.	
DPG	lb.	.55 / .65
El-Sixty	lb.	
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.42 / .51
Hepteen	lb.	
Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.11
Witco	lb.	.11
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
O. N. V.	lb.	
Ovac	lb.	
Pipsolene	lb.	1.60 / 1.85
R-2	lb.	1.50 / 1.80
Base	lb.	3.30 / 3.75
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene	lb.	
Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lb.	
Ureka	lb.	.62 / 1.00
Blend B	lb.	.62 / .75
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z-B-X	lb.	
Z-88-P	lb.	$0.48 /$0.60
Zenite	lb.	
A	lb.	
B	lb.	
Zimate	lb.	
ZML	lb.	
Activator		
Barak	lb.	
Age Resisters		
AgeRite Alba	lb.	
Exel	lb.	
Gel	lb.	
Hipar	lb.	
HP	lb.	
Powder	lb.	
Resin	lb.	
D	lb.	
Syrup	lb.	
White	lb.	
Akroflex C	lb.	
Albasan	lb.	
Antox	lb.	
B-L-E	lb.	
B-X-A	lb.	
Copper Inhibitor X-872	lb.	
Flectol B	lb.	.54 / .65
H	lb.	.54 / .65
White	lb.	.95 / 1.15
M-U-F	lb.	
Neozone (standard)	lb.	
A	lb.	
C	lb.	
D	lb.	
E	lb.	
Oxynone	lb.	.66 / .75
Parazone	lb.	
Perflectol	lb.	.67 / .75
Permalux	lb.	
Solux	lb.	
Thermoflex	lb.	
A	lb.	
V-G-B	lb.	
Alkalies		
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	3.00 / 4.00
liquid, 50%	100 lbs.	2.25
solid (700 lb. drums)	100 lbs.	2.60 / 3.00
Antiscorch Materials		
Antiscorch T	lb.	
Cumar RH	lb.	.09
Retarder B	lb.	
W	lb.	
T-J-B	lb.	
U.T.B.	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Brake Lining Saturant		
B. R. T. No. 3	lb.	.016 / .018
Colors		
BLACK		
Lampblack (commercial)	lb.	.15
BLUE		
Brilliant	lb.	
Prussian	lb.	
Toners	lb.	.80 / 3.50
BROWN		
Mapico	lb.	$0.13
GREEN		
Brilliant	lb.	
Chrome, light	lb.	
medium	lb.	
oxide	lb.	.18½
Dark	lb.	
Guignet's	lb.	.70
Light	lb.	
Toners	lb.	.85 /$3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, 15/17%	lb.	
R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
Golden 15/17%	lb.	
7-A	lb.	.35
Z-2	lb.	.22
Aristi	lb.	
Cadmium, light (400 lb. bbls.)	lb.	.70
Chinese	lb.	
Crimson	lb.	
Mapico	lb.	.09¼
Medium	lb.	
Rub-Er-Red	lb.	.09¼
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb.	.04¼/ .04½
Astrolith (5-ton lots)	lb.	.04¼
Azolith	lb.	.04¼/ .04½
Cryptone-19	lb.	.05¼/ .06
CB-21	lb.	.05¼/ .06
ZS No. 20	lb.	.09 / .09¼
No. 86	lb.	.09 / .09¼
Sunolith (5-ton lots)	lb.	.04¼
Ray-Bar	lb.	
Ray-Cal	lb.	
Rayox	lb.	
Titanolith (5-ton lots)	lb.	.05¾
Titanox-A (50-lb. bags)	lb.	.16 / .16¾
B (50-lb. bags)	lb.	.05¾/ .06
B-30 (50-lb. bags)	lb.	.05¾/ .06
C (50-lb. bags)	lb.	.05¾/ .06
Ti-Tone	lb.	
Zinc Oxide		
Anaconda, Green Seal		
No. 333	lb.	.06¼/ .06½
Lead Free No. 352	lb.	.05¼/ .05½
No. 570	lb.	.05¼/ .05½
No. 577	lb.	.05¼/ .05½
Red Seal No. 222	lb.	.05¼/ .06
U.S.P. No. 777 (bbls.)	lb.	.08
White Seal No. 555	lb.	.06¼/ .07

Azo ZZZ-11	lb.	$0.05¼/	$0.05½
44	lb.	.05¼/	.05½
55	lb.	.05¼/	.05½
66	lb.	.05¼/	.05½
French Process, Florence White Seal-7 (bbls.)	lb.	.06¼/	.07
Green Seal-8	lb.	.06¼/	.06½
Red Seal-9	lb.	.05¾/	.06
Kadox, Black Label-15	lb.	.05¼/	.05½
Blue Label-16	lb.	.05¼/	.05½
Red Label-17	lb.	.05¼/	.05½
Horse Head Special 3	lb.	.05¼/	.05½
XX Red-4	lb.	.05¼/	.05½
23	lb.	.05¼/	.05½
72	lb.	.05¼/	.05½
78	lb.	.05¼/	.05½
80	lb.	.05¼/	.05½
103	lb.	.05¼/	.05½
110	lb.	.05¼/	.05½
St. Joe (lead free) Black Label No. 20	lb.	.05¼/	.05½
Green Label No. 42	lb.	.05¼/	.05½
Red Label No. 30	lb.	.05¼/	.05½
U.S.P. X	lb.	.08 /	.08¼
White Jack	lb.	.09 /	.09¼

YELLOW

Cadmolith (cadmium yellow), 400 lb. bbls.	lb.	.45	
Lemon	lb.		
Mapico	lb.	.09½	
Toners	lb.	2.50	

Dispersing Agents

Bardol	lb.	.021 /	.023
Darvan	lb.		

Factice

Amberex	lb.	.23	
Brown	lb.	.08 /	.13
Duphax A	lb.	.12	
B	lb.	.12	
Fac-Cel B	lb.	.15	
C	lb.	.15	
White	lb.	.10 /	.15

Fillers, Inert

Asbestine, c.l., f.o.b. mills	ton	15.00	
Barytes	ton	30.00	
f.o.b. St. Louis (50 lb. paper bags)	ton	22.85	
off color, domestic	ton	20.00	/25.00
white, imported	ton	29.00	/32.00
Blanc fixe, dry, precip	lb.	.03½/	.05
Calcene	ton	37.50	/45.00
Infusorial earth	lb.	.02 /	.03
Kalite No. 1	ton		
No. 3	ton		
Magnesia, calcined, heavy	lb.	.04	
carbonate	lb.	.06½/	.07
Pyrax	ton		
Whiting Columbia Filler	ton	9.00	/14.00
Domestic	100 lbs.		
Guilders	100 lbs.		
Hakuenka	lb.		
Paris white, English cliff-stone	100 lbs.		
Southwark Brand, Commercial	100 lbs.		
All other grades	100 lbs.		
Suprex, white extra light	ton	45.40	/60.00
heavy	ton	45.40	/60.00
Witco, c.l.	ton	7.00	

Fillers for Pliability

P-33	lb.		
Thermax	lb.		
Velvetex	lb.	.03 /	.04½

Finishes

IVCO lacquer, clear	gal.	1.00 /	2.25
colors	gal.	2.85 /	3.25
Rubber lacquer, clear	gal.		
colored	gal.		
Starch, corn, pwd	100 lbs.		
potato	lb.		
Talc	ton	25.00	/45.00

Flock

Cotton flock, dark	lb.	.11½/	.14
dyed	lb.	.50	
white	lb.	.14½/	.20
Rayon flock, colored	lb.	1.25 /	1.60
white	lb.	1.10	

Latex Compounding Ingredients

Accelerator 85	lb.		
89	lb.		
122	lb.		
552	lb.		
Alphasol-OS	lb.		
Antox, Dispersed	lb.		
Aquarex A	lb.		
D	lb.		
F	lb.		
Aresklene 375	lb.	.35 /	.50
Black No. 25, Dispersed	lb.	.22 /	.40
Catalpo	ton		
Color Pastes, Dispersed	lb.		
Dispersex No. 15	lb.	.80 /	.95
No. 20	lb.	.60 /	.75
Emo, brown	lb.	.14	
white	lb.	.14	
Factice Compound, Dispersed	lb.	.36	
Heliozone, Dispersed	lb.		
Igepon A	lb.		
MICRONEX, Colloidal	lb.	$0.06	/$0.07
Nekal BX (dry)	lb.		
Palmol	lb.	.10	
Paradors	lb.		
Stablex A	lb.	1.75	
B	lb.	.90	
C	lb.	.30	
Sulphur, Dispersed	lb.	.10 /	.15
No. 2	lb.		
T.1. (400 lb. drums)	lb.	.40	
Tepidone	lb.		
Vulcan Colors	lb.		
Zinc oxide, Colloidal	lb.		
Dispersed	lb.	.09 /	.15

Mineral Rubber

B. R. C. No. 20	lb.	.0125/	.014
Black Diamond	ton	25.00	
Genasco Hydrocarbon, granulated, (fact'y)	ton		
solid	ton		
Gilsonite Hydrocarbon (factory)	ton		
Hydrocarbon, hard	ton		
soft	ton		
Parmr Grade 1	ton	25.00	
Grade 2	ton	25.00	
Pioneer	ton		
265°	ton		

Mold Lubricants

Mold Paste	lb.	.12 /	.30
Sericite	ton	65.00	/75.00
Soapbark	lb.		
Soapstone	ton	25.00	/35.00

Oil Resistant

AXF	lb.		

Reclaiming Oils

B. R. V.	lb.	.039 /	.041
S. R. O.	lb.	.015 /	.019

Reenforcers

Carbon Black			
Aerfloted Arrow Specification Black	lb.	.0535/	.0825
Arrow Compact Granulized Carbon Black	lb.		
"Certified" Heavy Compressed, Cabot	lb.		
Spheron	lb.		
Dispersо (delivered)	lb.	.0445/	.0535
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock delivered	lb.	.07 /	.08¼
Dixiedensed, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock delivered	lb.	.07 /	08¼
Dixiedensed 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock delivered	lb.	.07 /	.08¼
Excello, c.l., f.o.b. Gulf ports	lb.	.0445/	.0645
delivered New York	lb.	.0535/	.0735
l.c.l., delivered New York	lb.	.07 /	.08¼
Fumonex, c.l., f.o.b. works	lb.	.03	
ex-warehouse	lb.	.04½	
Gastex	lb.	.03 /	.07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock delivered	lb.	.07 /	.08¼
Kosmobile 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, delivered	lb.	.07 /	.08¼
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock delivered	lb.	.07 /	.08¼
MICRONEX Beads, c.l., f.o.b. Gulf ports	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, l.c.l., delivered	lb.	.07 /	.08¼
Mark II, c.l., f.o.b. Gulf ports	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, l.c.l., delivered	lb.	.07 /	.08¼
Standard, c.l., f.o.b. Gulf ports	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, l.c.l., delivered	lb.	.07 /	.08¼
W-5, c.l., f.o.b., Gulf ports	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, l.c.l., delivered	lb.	$0.07	/$0.08¼
W-6, c.l., f.o.b., Gulf ports	lb.	.0445	
c.l., delivered New York	lb.	.0535	
local stock, l.c.l., delivered	lb.	.07 /	.08¼
Pelletex	lb.	.03 /	.07
Supreme, c.l., f.o.b. Gulf ports	lb.	.0445/	.0645
delivered New York	lb.	.0535/	.0735
l.c.l., delivered New York	lb.	.07 /	.08¼
"WYEX BLACK"	lb.		
Carbonex	lb.	.03 /	.0375
Carbonex "S"	lb.	.0315/	.04
Clays			
Aerfloted Paragon	ton	8.50	
Suprex No. 1 Selected	ton	10.00	
No. 2 Standard	ton	8.50	
China	ton	17.50	/20.00
Dixie	ton		
Junior	ton		
McNamee	ton		
Par	ton		
Witco	ton	8.50	
Cumar EX	lb.	.04	

Reodorants

Amora A	lb.		
B	lb.		
C	lb.		
D	lb.		
Paradors	lb.		
Rodo No. 0	lb.		
No. 10	lb.		

Rubber Substitutes

Black	lb.	.07 /	.11
Brown	lb.	.08 /	.14
White	lb.	.08½/	.14

Softeners

Burgundy pitch	lb.	.05	
Cycline oil	gal.	.15 /	.28
Palm oil (Witco)	lb.	.05½	
Petrolatum, amber (f.o.b. refinery, Warren, Pa.)	lb.	.027⅛/	.04
light amber	lb.	.03⅛/	.04¼
Pine tar	gal.		
Plastogen	lb.		
Reogen	lb.		
Rosin oil, compounded	gal.	.40	
RPA No. 1	lb.		
Rubtack	lb.	.10	
Tackol	lb.	.085 /	.18
Tonox	lb.		
Powder	lb.		
Witco No. 20	gal.	.15	

Softeners for Hard Rubber Compounding

RSL Resin	lb.	.25 /	.35
Resin C Pitch 55° C. M.P.	lb.	.0125/	.0145
Resin C Pitch 70° C. M.P.	lb.	.0125/	.0145
Resin C Pitch 85° C. M.P.	lb.	.0125/	.0145

Solvents

Beta-Trichlorethane	gal.		
Bondogen	lb.		
Carbon bisulphide	lb.		
tetrachloride	lb.		

Stabilizers for Cure

Laurex, ton lots	lb.		
Stearex B	lb.	.095 /	.105
Beads	lb.	.093 /	.101
Stearic acid, single pressed	lb.	.095 /	.105
Stearite	100 lbs.	9.30	/10.10
Zinc stearate	lb.	.23	

Synthetic Rubber

"DuPrene"[1] Latex Type 50	lb.		
53	lb.		
54	lb.		
Type E	lb.		
"Thiokol" A (f.o.b. Yardville)	lb.	.35	
Coating Materials	gal.	3.00 /	5.00
D	lb.	.65	
Molding Powder	lb.	.55 /	.70

Tackifier

B. R. H. No. 2	lb.	.014 /	.020

Varnish

Shoe	gal.	1.45	

Vulcanizing Ingredients

Sulphur Chloride, drums	lb.	.03½/	.04
Rubber	100 lbs.		
Telloy	lb.		
Vandex	lb.		

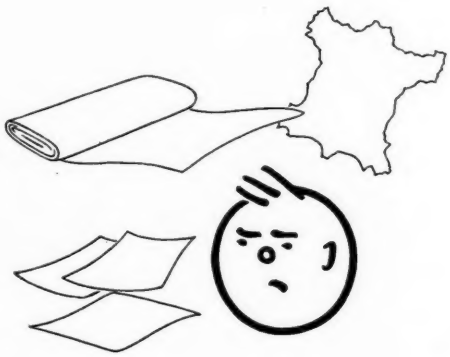
(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	lb.		
2 N.C.	lb.		
3 N.C.	lb.		
1 Yellow	lb.		
2	lb.		
Montan, crude	lb.		

[1] Trade mark registered.

ARE YOU STUMPED
WITH A
LATEX ODOR
PROBLEM?



If you are—forget it. Use Givaudan's new

Latex Paradors

and your problem is solved. Givaudan's LATEX PARADORS are completely effective. They eliminate all the obstacles that hitherto have prevented correct deodorization in latex products. No more trouble from discoloration, instability, non-compatibility, coagulation. The PARADORS overcome all these difficulties and do the job quickly, effectively and economically. There are five LATEX PARADORS—each designed to successfully deodorize a special type of product in which latex is used—textile fabrics, leather, paper and other merchandise. Would you like samples to prove their efficiency?

GIVAUDAN
DELAWANNA INC.
Industrial Aromatics Division
80 Fifth Avenue, New York, N. Y.

Regular and Special Constructions
of
COTTON FABRICS

Single Filling Double Filling
and
ARMY
Ducks

HOSE and BELTING
Ducks

Drills

Selected
Osnaburgs

Curran & Barry
320 BROADWAY
NEW YORK

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Sept. 26	Oct. 31	Nov. 7	Nov. 14	Nov. 21
Oct.	11.94	.....	.....	.....	.....
Nov.	.....	11.63	11.90	.....	.....
Dec.	11.88	11.63	11.90	11.73	11.77
Mar.	11.84	11.64	11.87	11.59	11.71
July	11.74	11.61	11.79	11.45	11.61
Sept.	.....	11.29	11.55	11.23	11.40
Oct.	.....	11.14	11.42	11.11	11.30

New York Quotations

November 25, 1936

Drills		
38-inch 2.00-yard	yd.	$0.15
40-inch 3.47-yard		.10
50-inch 1.52-yard		.20
52-inch 1.85-yard		.16¾
52-inch 1.90-yard		.16
52-inch 2.20-yard		.14¾
52-inch 2.50-yard		.13
59-inch 1.85-yard		.16
Ducks		
38-inch 2.00 yard D. F.	yd.	.15
40-inch 1.45-yard S. F.		.20¾
51½-inch 2.35-yard D. F.		.21½
72-inch 1.05-yard D. F.	$0.30	/.30½
72-inch 17.21-ounce		.32½
MECHANICALS		
Hose and belting	lb.	.28½
TENNIS		
52-inch 1.35-yard	yd.	.22¼
***Hollands**		
GOLD SEAL		
20-inch No. 72	yd.	.10
30-inch No. 72		.18
40-inch No. 72		.20
RED SEAL		
20-inch	yd.	.08¾
30-inch		.16¼
40-inch		.17½
50-inch		.20
Osnaburgs		
40-inch 2.34-yard	yd.	.11⅝/.12⅝
40-inch 2.48-yard		.11 /.11⅞
40-inch 2.56-yard		.10⅝
40-inch 3.00-yard		.09⅞
40-inch 7-ounce part waste		.10¼
40-inch 10-ounce part waste		.14⅜
37-inch 2.42-yard		.12¼
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.11½
Plaids 60 x 48		.12¾
Surface prints 60 x 64		.13¾
Print cloth, 38½-inch, 60 x 64		.08
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.10½
64 x 68, 3.15-yard		.10½
56 x 60, 3.60-yard		.09¼
44 x 40, 4.25-yard		.07
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.06⅝
44 x 40, 6.15-yard		.05¾
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.32½
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.30½
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.31½
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.31½
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.29½
23/5/3 Karded peeler, 1¼" cotton	lb.	.35½
23/5/3 Combed Egyptian	lb.	.47½
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.31½

*For less than 1,000 yards of a width add 10% to given prices.

THE accompanying table gives the general trend of representative cotton futures for approximately the last two months. Spot middlings, from 12.08¢ on October 31, made a strong advance in the succeeding week, closing at 12.35¢ on November 9. From this level it fell off to 12.10¢ on November 12, regaining to 12.18 on Nober 14, to reach 12.30¢ on November 17, but fell to 12.22¢ on November 21.

The Crop Reporting Board of the Department of Agriculture forecast current crop production at 12,400,000 as of November 1, an increase of 791,000 bales over the estimate for October. Regarding this the board declared:

"The increase in prospective outturn results from fall weather almost ideal for the maturing and picking of the crop. When average weather conditions prevail, there is usually some loss of open cotton in the fields, but this season practically no losses of this kind have occurred. In the Carolinas, and generally along the northern portion of the belt, frosts came later than usual, which permitted the maturing of a large portion of the late bolls which were in danger a month ago."

The ninth "Cotton Year Book of the New York Cotton Exchange" issued in November contains the following:

"Consumption last season exceeded the largest recorded in any previous season by 1,951,000 bales. World production, on the other hand, was 1,708,000 bales less than the largest world crop in any previous season, and was 1,467,000 bales less than consumption during the season.

"World consumption last season was 27,729,000 bales, while production of commercial cotton was only 26,262,000 bales, according to statistics in the book. In consequence of the large excess of consumption over production, the world cotton carryover was reduced last season from 14,575,000 to 13,073,000 bales. The carryover at the end of last season was 4,576,000 bales less than that in 1932, when it stood at 17,649,000 bales."

Fabrics

The market on coarse yarn fabrics in the gray grow firmer under the steadily increasing demand, and forward contract engagements are covering a period of three months or more. Deliveries rather than price alone dominate the swing over to what was known as a "sellers' market." Substantial premiums are being paid for deliveries through March, and many orders for sheetings are being booked through the second quarter at full market prices.

All raincoat manufacturers are now looking for new styles in coats for spring, but it is too early to predict what the prevailing selections will be.

RUBBER SCRAP

THE demand for all grades of rubber scrap is active and increasing steadily to keep pace with consumption. The market is advancing on all grades. The movement of scrap from dealers' stocks to consumers is in volume sufficient to stimulate the work of collectors to maintain the adequacy of dealers' stocks.

Current quotations have been advanced on all grades of boots and shoes, tubes and tires, also on mixed black scrap and No. 1 hard rubber. Solid tires and mechanical scrap other than mixed black grade are quoted unchanged.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

November 25, 1936

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01⅛/$0.01¼
Colored	lb.	.00⅞/ .01
Untrimmed arctics	lb.	.00⅞/ .01
Inner Tubes		
No. 1, floating	lb.	.11 / .11½
No. 2, compound	lb.	.04¾/ .04⅞
Red	lb.	.04⅜/ .04½
Mixed tubes	lb.	.04¼/ .04⅜
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	11.50 /12.00
Beadless	ton	15.00 /16.00
Auto tire carcass	ton	17.00 /18.00
Black auto peelings	ton	16.00 /17.00
Solid		
Clean mixed truck	ton	31.50 /33.00
Light gravity	ton	36.00 /37.00
Mechanicals		
Mixed black scrap	ton	18.00 /20.00
Hose, air brake	ton	18.00 /20.00
Garden, rubber covered	ton	14.00 /15.00
Steam and water, soft	ton	14.00 /15.00
No. 1 red	lb.	.03 / .03¼
No. 2 red	lb.	.02¾/ .03
White druggists' sundries	lb.	.04½/ .05
Mechanical	lb.	.03¾/ .04
Hard Rubber		
No. 1 hard rubber	lb.	.12¼/ .12¾

JAPAN

(*Continued from page 68*)

have intrenched herself particularly in India, where the bulk of the cheaper grades of rubber-soled canvas shoes worn by the natives was of Japanese origin. But she is steadily losing ground here, again owing to increased local production. There was a sharp decline in this business in the fiscal year ended March, 1936, as compared with the preceding year, and the downward trend continues. For the first three months of the current fiscal year (April-June, 1936) India imported 410,532 pairs, value 500,000 rupees, against 779,424 pairs, value 700,000 rupees, in the corresponding period of 1935. This decline was wholly due to the steep cut in the imports from Japan, which came to only 295,102 pairs, value 150,000 rupees, against 659,896 pairs, value 350,000 rupees.

COLUMBUS SHEETINGS

for the Rubber Trade

It is important that rubber manufacturers recognize that COLUMBUS SHEETINGS are made to meet their most rigid *specifications.*

For many years, we have worked with purchasing agents and engineers of the rubber industry and can give positive assurance of the performance of this famous line of industrial sheetings.

WELLINGTON SEARS COMPANY
65 WORTH STREET NEW YORK CITY

Boston Philadelphia Atlanta Detroit Chicago St. Louis New Orleans San Francisco

Patents and Trade Marks

MACHINERY

United States

2,054,822. **Cementer.** I. L. Keith, Haverhill, Mass.

2,055,002. **Foraminous Coated Material Producer.** F. J. Chandler, Toledo, O.

2,055,292. **Synthetic Thread Apparatus.** G. S. Hiers, Bala-Cynwyd, assignor to Collins & Aikman Corp., Philadelphia, both in Pa.

2,055,450. **Waterproof Fabric Calender.** H. L. Bender, Bloomfield, and F. I. Bennett, Jr., Highland Park, assignors to Johnson & Johnson, New Brunswick, all in N. J.

2,055,877. **Insulating Material Apparatus.** J. F. Palmer, St. Joseph, Mich.

2,056,331. **Press.** J. C. Shutt, Wickliffe, assignor to Ohio Rubber Co., Cleveland, both in O.

2,056,406. **Imitation Leather Apparatus.** R. Mayne, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,057,021. **Hot Knife for Rubber Thread.** J. R. Gammeter, Akron, O., assignor to United States Rubber Co., New York, N. Y.

2,057,029. **Flexible Material Combiner and Winder.** R. McC. Johnstone, Short Hills, N. J., assignor to Cameron Machine Co., Brooklyn, N. Y.

2,057,032. **Fluid Material Flow Controller.** A. W. Keen, Passaic, N. J., assignor to United States Rubber Co., New York, N. Y.

2,057,043. **Tube Machine Closure Attaching Means.** E. T. Meehan, Shelton, assignor to Farrel-Birmingham Co., Inc., Ansonia, both in Conn.

2,057,200. **Tire Changer.** C. B. McCarthy, Mansfield, O.

2,057,457. **Ice Tray Expansion Joint Maker.** G. L. Tinkham, Detroit, Mich., assignor, by mesne assignments, to Inland Mfg. Co.

2,057,467. **Extruder.** T. H. Williams, assignor to National Rubber Machinery Co., both of Akron, O.

Dominion of Canada

360,562. **Sole and Heel Maker and Applier.** Footwear Machinery, Ltd., Huddersfield, assignee of L. Brown, Rochdale, both in England.

360,563. **Fluid Material Flow Controller.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of A. W. Keen, Passaic, N. J., U. S. A.

360,653. **Strip Material Maker.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. R. Gammeter, Akron, O. U. S. A.

360,805. **Jewelry Rubber Mold.** Goldsmith Bros. Smelting & Refining Co., Ltd., Toronto, assignee of T. G. Jungersen, Mimico, both in Ont.

360,947. **Chlorinated Rubber Product Apparatus.** Canadian Industries, Ltd., Montreal, P. Q., assignee of W. D. Spencer, Widnes, England.

361.106. **Sole and Heel Vulcanizer.** Panther Rubber Co., Ltd., Sherbrooke, P. Q., assignee of E. A. Sheehan, Stoughton, Mass., U. S. A.

361,116. **Rubber Stock Cutter.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of E. W. Stacey, Beverly, Mass., U. S. A.

Germany

634,315. **Device and Method to Make Rubber-Soled Footwear.** Harburger Gummiwarenfabrik Phoenix A.G., Harburg-Wilhelmsburg.

634,435. **Device to Make Corrugated Hose or Pipes.** J. Kopetz, Vienna, Austria. Represented by W. Harmsen, Berlin.

636,584. **Spreading Device for Viscous Aqueous Rubber Dispersions.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

636,842. **Vulcanizer for Retreading Tires.** K. Zangl, Munich.

637,144. **Device to Make Floor Coverings.** Kooperativa Forbundet, Forening, u.p.a. Stockholm, Sweden. Represented by G. Lotterhos, Frankfurt a.M., and M. Eule, Berlin.

637,335. **Device and Method to Make Rubber Thread.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

637,360. **Device to Fix Electric Pneumatic Tire Control for Twin Tires.** E. Redel, Berlin-Neukolln.

637,399. **Device and Method to Clean Rubber Objects.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

637,635. **Device and Method to Crimp Rubber Sheet.** United States Rubber Co., New York, N. Y., U. S. A. Represented by H. Schiedegger, Berlin.

637,636. **Device and Method to Make Porous Objects as Filters, Diaphragms, Etc.** L. Wilderman, Monaco. Represented by M. Singelmann, Berlin.

637,755. **Device and Method to Make Cut Thread from Vulcanized Sheet.** Deutsche Dunlop Gummi-Co. A.G., Hanau a.M.

PROCESS

United States

2,055,821. **Textile and Rubber Thread Cord.** C. F. Hansen, Oslo, and E. Meier, Skoyen, both in Norway.

2,056,278. **Fabric Belting Splice.** H. M. Kuhn, Clifton, N. J., assignor to United States Rubber Products, Inc., New York, N. Y.

2,056,323. **Shoe.** K. Kilburn, Boston, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

2,057,331. **Pulp.** H. C. Fisher, Cincinnati, and G. Acus, Arlington Heights, assignors to Richardson Co., Lockland, all in O.

Dominion of Canada

360,489. **Rubber Thread.** T. L. Shepherd, London, England.

360,559. **Fabric Belting.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of H. M. Kuhn, Clifton, N. J., U. S. A.

360,564. **Rubber Film.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of V. H. Hurt, Naugatuck, Conn., U. S. A.

360,704. **Sponge Rubber.** Roth Rubber Co., assignee of C. F. Flemming, both of Cicero, Ill., U. S. A.

360,850. **Shipping Sheet Metal.** Signode Steel Strapping Co., Chicago, Ill., assignee of E. B. Ricketts and A. H. Moon, co-inventors, both of Middletown, O., all in the U. S. A.

361,152. **Separable Fastener.** Lightning Fastener Co., Ltd., St. Catharines, Ont., assignee of G. H. C. Corner, Sutton Coldfield, England.

Germany

635,700. **Improving Serial Production of Articles of Same Shape, but with Varying Surface Pattern.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

635,808. **Producing Articles from Aqueous Rubber Dispersion.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.

636,197. **Continuous Colored Designs on Rubber.** Vorwerk & Sohn, Wuppertal-Barmen.

636,261. **Articles from Rubber Dispersions.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.

636,414. **Patterned Rubber Goods.** Romika Shuhfabrik A.G., Gusterath, Kr. Trier.

636,770. **Articles of Rubber, Etc., with Sponge-like Texture.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and W. H. Chapman, E. W. B. Owen, D. W. Pounder, all of Ft. Dunlop, England. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

637,735. **Bouncing Balls.** Hessische Gummiwarenfabrik Fritz Peter A.G., Klein-Auheim a.M.

637,837. **Artificial Leather.** Stedfast Rubber Co., Inc., Boston, Mass., U. S. A. Represented by H. Barschall, Berlin-Charlottenburg.

637,838. **Rubber Powder.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, Berlin.

CHEMICAL

United States

2,054,943. **Thread Treating Composition.** A. D. Macdonald, Yonkers, N.

Y., assignor to Boston Blacking & Chemical Co., Boston, Mass.

2,055,019. **Transparent Composition Treated Fabric.** W. B. Serrington, Boston, Mass.

2,055,691. **Lining Insulating Composition.** P. M. J. Bardou-Job and H. F. Hébrard, both of Perpignan, France, assignors to Ré, Saint-Marguerite, Ceret, Pyrenees-Orientales, France, a joint stock company of France.

2,055,806. **Accelerator.** R. L. Sibley, Nitro, W. Va., assignor, by mesne assignments, to Monsanto Chemical Co., Wilmington, Del.

2,055,812. **Age Resister.** D. J. Beaver, Nitro, W. Va., assignor, by mesne assignments, to Monsanto Chemical Co., Wilmington, Del.

2,056,026. **Plastic Compound.** D. F. Twiss and A. E. T. Neale, both of Birmingham, England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,056,558. **Slab Composition.** G. W. Beldam, Lower Bourne, England.

2,056,569. **Latex Treatment.** R. W. Eldridge, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,056,836. **Elastic Body for Coating Metal.** W. W. Duecker and C. R. Payne, both of Pittsburgh, Pa., assignors to Texas Gulf Sulphur Co., a corporation of Tex.

2,056,837. **Refining Olefine Sulphide.** W. W. Duecker and C. R. Payne, both of Pittsburgh, Pa., assignors to Texas Gulf Sulphur Co., a corporation of Tex.

2,056,924. **Zinc Oxide Dispersion.** W. A. Kalber, Somerville, assignor to Dewey & Almy Chemical Co., N. Cambridge, both in Mass.

2,056,958. **Floor Covering Composition.** E. T. A. Coughlin, Park Ridge, Ill., assignor to Barber Asphalt Co., Philadelphia, Pa.

2,057,319. **Accelerator.** W. Scott, Nitro, W. Va., assignor, by mesne assignments, to Monsanto Chemical Co., Wilmington, Del.

2,057,442. **Chlor-Rubber Body Production.** F. Mik, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, both of Frankfurt a.M., Germany.

Dominion of Canada

360,690. **Coagulated Rubber Artificial Dispersions.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. A. Murphy and E. W. Madge, co-inventors, both of Birmingham, England.

360,748. **Floor Covering Composition.** F. T. Walker, London, England, and A. C. Hetherington, Ardrossan, Scotland, co-inventors.

360,800. **Plastic Composition.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of L. J. De Holczer, Bridgeport, Conn., U. S. A.

360,835. **Acoustic Tile Composition.** C. F. Burgess Laboratories, Inc., assignee of M. H. Kliefoth, both of Madison, Wis., U. S. A.

360,836. **Rubber Dispersion.** C. F. Burgess Laboratories, Inc., assignee of M. H. Kliefoth, both of Madison, Wis., U. S. A.

360,946. **Emulsified Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of C. W. Richards, Runcorn, and H. Dodd, Glazebrook, co-inventors, both in England.

GENERAL

United States

2,053,258. **Shaving Implement.** L. Axien, Altona-Elbe, Germany.

2,053,386. **Electric Push Plug.** F. E. Wheeler, Buffalo, N. Y.

2,053,471. **Kneeling Bench.** E. F. Frost, assignor to Frost Rubber Works, both of Chicago, Ill.

2,053,502. **Bottom Filler.** I. Tarlow, Brockton, Mass.

2,053,519. **Tire Bead.** G. F. Crowley, Bridgeport, Conn., assignor to National-Standard Co., Niles, Mich.

2,053,538. **Airplane Safety Chair.** A. B. Scott and E. Goulding, both of Los Angeles, Calif.

2,053,626. **Tube Elastic Coupling.** A. L. Parker, Cleveland, O.

2,053,711. **Freezing Tray.** J. S. Glomb, Barberton, assignor of ½ to R. S. Boyle, Akron, both in O.

2,053,735. **Vehicle Wheel.** C. Overholser, Jefferson, Ore.

2,053,761. **Stocking.** R. Bloch, Pelham Manor, N. Y.

2,053,813. **Baby Shoe Protector.** P. W. Brennan, New York, N. Y.

2,053,815. **Cinema Film Bobbin.** E. V. de Panthou and R. Varela, both of Buenos Aires, Argentina.

2,053,865. **Lady's Slip.** R. D'Amato, New York, N. Y.

2,053,892. **Fountain Pen.** C. W. Beck, Toledo, O.

2,053,899. **Electric Light Socket.** H. J. Dunbar, Jr., Wilmington, Del.

2,053,914. **Flexible Dental Tray.** M. W. Mann, Kansas City, Mo.

2,053,995. **Ear Plug.** L. M. Hoey, San Antonio, Tex.

2,054,010. **Cable.** E. Fischer, Berlin-Lichterfelde, assignor to Siemens & Halske A. G., Siemensstadt, both in Germany.

2,054,037. **Sidewalk Bumper.** W. Kundel, Hoboken, assignor to W. Kundel and V. G. Blenner, both of Woodcliff, all in N. J.

2,054,046. **Cable System.** W. Vogel, Cologne-Mulheim, Germany, assignor, by mesne assignments, to Protona A. G., Basel, Switzerland.

2,054,059. **Hosiery.** W. J. Longtin, assignor to Infant Socks Co., both of Reading, Pa.

2,054,151. **Arch Support.** H. L. Whitman, Bridgewater, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

2,054,163. **Eraser.** J. Meilner, W. Orange, N. J., assignor to Eagle Pencil Co., New York, N. Y.

2,054,198. **Sponge Applicator.** W. B. Jones, Chicago, Ill.

2,054,225. **Auxiliary Wheel.** W. H. Lewis, Newburgh, N. Y.

2,054,233. **Brush.** B. I. C. Young, Pasadena, Calif.

2,054,265. **Connecter.** M. M. Muguerditchian, Washington, D. C.

2,054,310. **Diaper Cover.** L. Warinner, Portland, Ore.

2,054,313. **Printer and Embosser.** C. G. Bright, Appleton, assignor to Paper Patents Co., Neenah, both in Wis.

2,054,323. **Refrigerator.** W. C. Holbrook, Dayton, O., assignor, by mesne assignments, to General Motors Corp., a corporation of Del.

2,054,330. **Combination Garment.** A. M. Le May, Chicago, Ill., assignor to S. H. Camp & Co., Jackson, Mich.

2,054,348 and 2,054,349. **Sealing Connection.** C. Wantz, assignor to Milwaukee Gas Specialty Co., both of Milwaukee, Wis.

2,054,361. **Vehicle Splash Guard.** J. H. Cohen, assignor to Casco Products Corp., both of Bridgeport, Conn.

2,054,439. **Brassiere and Slip.** B. Nichthauser, New York, N. Y.

2,054,465. **Electrical Connecter.** L. C. Ouellet, assignor of 25% to Dr. E. A. Martin, both of Edmundston, N. B., Canada.

2,054,527. **Playing Surface.** M. C. Teague, Jackson Heights, assignor, by mesne assignments, to United States Rubber Co., New York, both in N. Y.

2,054,605. **Artificial Flower.** S. H. Rogers, Pasadena, Calif.

2,054,612. **Electrical Connecter.** H. B. White, Canton, assignor to Hoover Co., N. Canton, both in O.

2,054,619. **Belt.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,054,620. **Printing Medium.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,054,668. **Mat.** J. A. Beard, Jr., Mishawaka, Ind.

2,054,691. **Electric Accumulator Hydrometer.** A. W. Browne, Clifton Junction, England, assignor to Electric Storage Battery Co., Philadelphia, Pa.

2,054,699. **Storage Battery Container.** H. D. Geyer, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

2,054,771. **Segmental Grinding Wheel.** T. Larsson, assignor to Norton Co., both of Worcester, Mass.

2,054,785. **Fruit and Vegetable Box.** M. L. Harris, Overbrook Hills, Pa.

2,054,803 and 2,054,804. **Wheel.** R. J. Burrows and A. O. Williams, assignors to Clark Tructractor Co., all of Battle Creek, Mich.

2,054,849. **Massage Appliance.** G. Briggs, London, England.

2,054,863. **Fluid Pressure System Compressor.** W. F. Oliver, assignor to Hydraulic Brake Co., both of Detroit, Mich.

2,054,864. **Laminating Glass Apparatus.** W. Owen, Pittsburgh, Pa., assignor to Pittsburgh Plate Glass Co., a corporation of Pa.

2,054,958. **Extension Top Boot.** N. E. Tousley, Waban, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

2,054,965. **Tire Rim Hole Seal.** J. H. Clo, Baldwin, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

2,054,986. **Brassiere.** S. Kunstadter, assignor to Formfit Co., both of Chicago, Ill.

2,055,062. **Plug.** C. P. Berolzheimer, Chicago Heights, Ill.

2,055,072. **Cushion Shoe.** J. H. Everston, Milwaukee, Wis.

2,055,103. **Gasket.** E. E. Hewitt, Edgewood, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

2,055,223. **Insulated Wire.** L. Robbin, New Rochelle, N. Y., assignor to Vega Mfg. Corp., Wilmington, Del.

2,055,242. **Cushioning Device.** S. C. Smith, Aurora, Ill., assignor to Bendix Research Corp., S. Bend, Ind.

2,055,326. **Golf Ball.** L. A. Young, Detroit, Mich.

2,055,397. **Suction Cup.** M. Zaiger, Lynn, Mass.

2,055,461. **Tire.** T. F. Baddock, Lenox, Mass.
2,055,512. **Sluice Gate Seal.** G. A. Wallace, Zanesville, O.
2,055,519. **Vehicle Antenna Device.** P. Crosley, Jr., assignor to Crosley Radio Corp., both of Cincinnati, O.
2,055,531. **Milking Machine.** C. H. Hapgood, Nutley, N. J., assignor to De Laval Separator Co., New York, N. Y.
2,055,538. **Undergarment.** N. Imler, assignor to Royal Worcester Corset Co., both of Worcester, Mass.
2,055,574. **Insole.** H. Härtl, Dresden, Germany, assignor to J. Müller, Prague, Czechoslovakia.
2,055,629. **Bath Rug.** V. K. Marvin, Detroit, Mich.
2,055,635. **Artificial Leather.** M. O. Schur, assignor to Brown Co., both of Berlin, N. H.
2,055,695. **Water Bag.** W. W. MacDonald, Chicopee, Mass.
2,055,718. **Milking Machine Teat Cup.** J. H. Davis, Melbourne, Australia.
2,055,797. **Inner Tube.** G. P. Loomis, Silver Lake Village, O., assignor to B. F. Goodrich Co., New York, N. Y.
2,055,801. **Flusher.** J. A. Perry, assignor to G. L. Bason, both of Greensboro, N. C.
2,055,823. **Cushion Wheel.** A. F. Kinzey, Cuyahoga Falls, O.
2,055,845. **Walking Stick.** P. Marinacci, Syracuse, N. Y.
2,055,849. **Electrical Resistor.** J. J. Mucher, Brooklyn, N. Y.
2,055,853. **Filter Type Respirator Separator.** N. Schwartz, New York, N. Y.
2,055,854. **Jar Holder.** E. H. Stibbe, Peshtigo, Wis.
2,055,904. **Centrifuge Packing Box.** H. O. Lindgren, Appelviken, Sweden, assignor to De Laval Separator Co., New York, N. Y.
2,055,946. **Windshield Wiper.** B. P. Schmansky, Pontiac, Mich.
2,055,983. **Automatic Tire Inflator.** R. F. Peo, assignor to Houde Engineering Corp., both of Buffalo, N. Y.
2,056,012. **Pneumatic Tire.** E. W. Madge, Wylde Green, F. B. Jones, Handsworth, and D. Parkinson, Erdington, all in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.
2,056,024. **Panel Securer.** F. J. Stuart, assignor of ¼ to H. L. Sleigh and ¼ to A. S. Cheston, all of Birmingham, England.
2,056,037. **Rubber Heel to Shoe Attacher.** J. Coggans, Langside, Glasgow, Scotland.
2,056,064. **Tire Alarm and Inflation Equalizer.** W. Fenton, Philadelphia, Pa.
2,056,068. **Garment Lining.** F. Jones, Toronto, Ont., Canada.
2,056,085. **Electric Cable.** J. J. Alles, Wilkes-Barre, Pa.
2,056,106. **Pneumatic Spring.** J. W. Kuhn, Akron, O.
2,056,120. **Cap Applier.** C. H. Brinton, Oak Park, assignor to Standard Cap & Seal Corp., Chicago, Ill.
2,056,124. **Nursing Bottle.** J. F. Pierson and H. E. Krug, both of White Plains, N. Y.
2,056,130. **Electrical Conductor.** A. S. Watson, Norton, Mass., assignor to General Cable Corp., New York.
2,056,131. **Pneumatic Tire.** H. A. Brittain, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.
2,056,221. **Railway Car Center Bearing.** E. H. Wright, Detroit, and R. H. Upson, Ann Arbor, both in Mich., assignors to Pullman-Standard Car Mfg. Co., a corporation of Del.
2,056,222. **Railway Car Side Bearing.** E. H. Wright, Detroit, Mich., assignor to Pullman-Standard Car Mfg. Co., a corporation of Del.
2,056,237. **Engine Mounting.** R. S. Trott, Denver, Colo.
2,056,325. **Shoe Coater Nozzle.** W. L. MacKenzie, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.
2,056,326. **Boxing Glove.** J. Orsini, Clairton, Pa.
2,056,351. **Diaphragm Type Gage.** F. S. Gruver and E. Aschenbach, both of Sellersville, Pa., assignors to United States Gauge Co., New York, N. Y.
2,056,377. **Electrodic Instrument.** F. C. Wappler, New York, N. Y.
2,056,405. **Novelty Bath Sponge.** E. C. Lewis, New York, N. Y.
2,056,587. **Electric Plug.** W. H. Rozar, Akron, O.
2,056,639. **Pantie Girdle.** H. Wipperman, assignor to H. W. Gossard Co., both of Chicago, Ill.
2,056,740. **Flexible Model Form.** I. Rosenfeld, New York, N. Y.
2,056,754. **Pressure Gage.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., New York, both in N. Y.
2,056,777. **Windshield Wiper Blade and Arm Connection.** R. B. Evans, Detroit, Mich., assignor to E. S. Evans & Sons, a corporation of Mich.
2,056,856. **Sliding Clasp Fastener.** J. Hora, Wuppertal-Oberbarmen, Germany.
2,056,873. **Engine Mounting.** R. S. Trott, Denver, Colo.
2,056,957. **Chair Attachment.** T. A. Colbridge, Detroit, Mich.
2,056,965. **Posture Chair.** W. F. Herold, assignor to Bassick Co., both of Bridgeport, Conn.
2,057,009. **Visor.** F. L. Chadwick, assignor to Woodall Industries, Inc., both of Detroit, Mich.
2,057,171. **Anti-Slipping Tread and Floor Covering.** E. Van der Pyl, Holden, assignor to Norton Co., Worcester, both in Mass.
2,057,190. **Reenforced Gland Massager.** J. J. Haynos, San Bernardino, Calif.
2,057,195. **Air Valve.** A. Keefe, Akron, O.
2,057,321. **Tire Gage.** L. L. Alnett, Jr., Los Angeles, and H. T. M. Rice, San Gabriel, both in Calif.
2,057,341. **Artificial Denture.** H. D. Morgan, Youngstown, O.
2,057,345. **Carpet Sweeper Bumper.** F. W. Pullen, assignor to Bissell Carpet Sweeper Co., both of Grand Rapids, Mich.
2,047,346. **Double Wall Metal Barrel.** D. J. Reed, assignor to A. O. Smith Corp., both of Milwaukee, Wis.
2,057,370. **Motor Support.** R. O. Dehlendorf, University City, and J. A. Rodgers, St. Louis, assignors to Emerson Electric Mfg. Co., St. Louis, all in Mo.
2,057,387. **Tire Signal Device.** J. H. Loeb, Morgan City, La.
2,057,405. **Sink.** O. T. Webber, London, England.
2,057,415. **Road and Rail Transport Wheel.** E. Capo, Torino, Italy.
2,057,419. **Power Transmission Belt.** A. B. Crush, Louisville, Ky.
2,057,445. **Tire Deflation Switch.** J. F. Prospero, Jersey City, N. J.
2,057,470. **Elastic Buckle.** J. Anderson, Stockholm, Sweden.
2,057,497 and 2,057,498. **Separator.** D. R. McNeal, Abington, assignor to Andale Co., Philadelphia, both in Pa.
2,057,556. **Tire Indicator.** D. S. Cole, Cleveland Heights, O.
2,057,562. **Electric Cable.** P. Dunsheath, Kent, assignor to W. T. Henley's Telegraph Works Co., Ltd., London, both in England.
2,057,577. **Elastic Thread.** F. J. Kennedy, Needham, Mass.
2,057,590. **Tire Valve Stem Cap.** R. G. Rader, Dederick, Mo.
2,057,614. **Jar Holder and Top Remover.** F. F. Girard, Washingtonville, O.

Dominion of Canada

360,474. **Airplane Deicer.** J. E. Ramsbottom, B. Lockspeiser, and C. J. Stewart, co-inventors, all of S. Farnborough, England.
360,616. **Decalcomania Paper.** J. MacLaurin, Ware, Mass., U. S. A.
360,658. **Heel.** Panther Rubber Co., Ltd., Sherbrooke, P. Q., assignee of A. Greenbaum, Beachmont, Mass., and F. J. Kelley, Milwaukee, Wis., co-inventors, both in the U. S. A.
360,659. **Heel.** Panther Rubber Co., Ltd., Sherbrooke, P. Q., assignee of H. Crossman, Brookline, Mass., U. S. A.
360,733. **Ventilated Raincoat.** E. Leupin, Montreal, P. Q.
360,781. **Masonry Structure.** Atlas Mineral Products Co., assignee of E. B. Gates, both of Mertztown, Pa., U. S. A.
360,782. **Rubberized Product.** Edward G. Budd Mfg. Co., assignee of E. G. Budd, both of Philadelphia, Pa., U. S. A.
360,801. **Laminated Insulation Material.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of O. H. Smith, W. Englewood, N. J., U. S. A.
360,849. **Windshield Cleaner.** Productive Inventions, Inc., assignee of J. W. Anderson, both of Gary, Ind., U. S. A.
360,851, 360,852, and 360,857. **Windshield Cleaner.** Trico Products Corp., Buffalo, assignee of E. C. Horton, Hamburg, both in N. Y., U. S. A.
360,858. **Windshield Wiper.** Trico Products Corp., Buffalo, assignee of E. C. Horton, Hamburg, and H. Hueber, Buffalo, co-inventors, all in N. Y., U. S. A.
360,867. **Heel.** R. H. Boag, Otahuhu, Auckland, New Zealand.
360,901. **Elastic Body Band.** J. D. Best and A. A. Lind, co-inventors, both of Dunedin, Otago, New Zealand.
360,902. **Doll.** C. E. Bowers, Washington, D. C., U. S. A.
360,919. **Doll.** E. G. Schaeffer, New York, N. Y., U. S. A.
360,958. **Bumper Bead.** General Spring Bumper Corp., assignee of B. M. Short, both of Detroit, Mich., U. S. A.
361,027. **Preserves Sealer.** A. Bjorn, Brooklyn, N. Y., U. S. A.
361,031. **Sanitary Garment.** J. G. Frieman, Attica, O., U. S. A.
361,047. **Musical Instrument Keyboard.** G. Woodhouse, London, England, temporarily of New York, N. Y., U. S. A.

361,048. **Shipping and Storing Receptacle.** W. Kline, Wellington, and W. A. Brubaker, Akron, co-inventors, both in O., U. S. A.
361,053. **Thermo Hydrometer.** L. Edelmann, Chicago, Ill., U. S. A.
361,056. **Transmission Coupling.** W. W. Hamill, Chigwell, England.
361,057. **Elastic Fabric.** F. Jones, Toronto, Ont.
361,097. **Journal Box Dust Guard.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of C. C. Farmer, Pittsburgh, Pa., U. S. A.
361,102. **Gasoline Tractor.** Mercury Mfg. Co., assignee of W. Schroeder, both of Chicago, Ill., U. S. A.
361,131. **Bathing Cap.** E. S. Abram, inventor, and H. Eva, assignee of ½ of the interest, Stockport, England.
361,140. **Belt.** Dayton Rubber Mfg. Co., assignee of A. L. Freedlander, both of Dayton, O., U. S. A.
361,149. **Vibration Damper.** Johns-Manville Corp., New York, N. Y., assignee of G. W. Clarvoe, Somerville, N. J., both in the U. S. A.
361,174. **Panel Securer.** F. J. Stuart, inventor, H. L. Sleigh, and A. S. Cheston, each an assignee of ¼ of the interest, all of Birmingham, England.
361,183. **Gaiter.** A. Beauchemin, Montreal, P. Q.
361,186. **Massager.** C. H. Foster, S. Euclid, O., U. S. A.
361,199. **Wheel Spoke Securer.** E. Rimailho, Paris, France.

United Kingdom

447,009. **Bathing Suit.** H. D. Elkington, London. (Hungarian Rubber Goods Factory, Ltd., Budapest, Hungary.)
447,023. **Coat Lining.** F. Jones, Toronto, Ont., Canada.
447,026. **Railway Vehicle Wheel.** F. Krupp A. G., Essen, Germany.
447,027. **Universal Joint.** E. X. Loiret, Paris, France.
447,049. **Fastener.** W. C. Broadwell, Richmond Hill, N. Y., U. S. A.
447,098. **Golf Club.** A. E. Lard, Washington, D. C., U. S. A.
447,100. **Cushion.** F. M. Charles, London.
447,147. **Brassiere.** F. Frischmuth, Berlin, Germany.
447,158. **Bath.** C. M. Wright, London.
447,170. **Endless Track Vehicle.** Cleveland Tractor Co., Cleveland, O., U. S. A.
447,174. **Elastic Fabric.** Doguin Soc. Anon., Villeurbanne, France.
447,236. **Driving Belt.** J. J. Hjartsater, Nygard Railway Station, Norway.
447,274. **Vehicle Window Frame.** F. B. Dehn, London. (J. S. Reid, Shaker Heights, O., U. S. A.)
447,302. **Printing Device.** J. S. Wheelwright, Ltd., London, and J. S. Wheelwright, Tonbridge.
447,331. **Window Antirattler.** A. W. Courtenay, Eastbourne, and L. C. Kemp, Robertsbridge.
447,340. **Brassiere.** L. Willson, London.
447,344. **Mat.** W. S. Bauer, London.
447,352. **Ear Plug.** G. MacLellan & Co., Ltd., and K. MacLellan, both of Glasgow, Scotland.
447,372. **Tumbler Cleanser.** H. Kortz, Westphalia, Germany.
447,423. **Perambulator Spring Suspension.** W. Lines, London. (E. von Kanel, Thoune, Switzerland.)
447,425. **Gravity Separation Apparatus.** Stothert & Pitt, Ltd., Bath, and G. R. Beckerleg, Water Orton.
447,445. **Flower Harvester.** W. R. Macdonald, and D. J. Macdonald, Ltd., both of Dundee, and M. E. H. Burnett, Newtyle, all in Scotland.
447,447. **Bottle Capper.** A. H. S. Karlsson and S. J. Svensson, both of Linkoping, Sweden.
447,502. **Pipe Joint.** J. Dewrance, London.
447,523. **Life Saving Buoy.** G. F. Wilson and G. A. Evenden, both of Hamilton, Ont., Canada.
447,532. **Coupling.** Hardy, Spicer & Co., Ltd., Birmingham. (Spicer Mfg. Corp., Toledo, O., U. S. A.)
447,573. **Aircraft Brake.** J. M. C. De Oropesa, Madrid, Spain.
447,576. **Violin Support.** H. Korner, Paris, France.
447,588. **Rubber Spring.** Michelin & Cie., Clermont Ferrand, France.
447,596. **Upholstery Securer.** W. Marshall and Briggs Mfg. Co., both of Detroit, Mich., U. S. A.
447,616. **Sliding Clasp Fastening.** J. L. Larroque, Rouen, France, and Lightning Fasteners, Ltd., London.
447,629. **Milking Machine.** Aktiebolaget Separator, Stockholm, Sweden.
447,638. **Cricket Bat Handle.** Baker, Macpherson & Co., Ltd., Stanmore, Australia.
447,660. **Pipe Joint.** G. B. Brader, London.
447,702. **Pipe Cleaner.** W. A. Grant, (trading as Grant & Johnson), Leeds.
447,724. **Vehicle Spring Suspension.** H. C. Brinkers, Wassenaar, and H. F. Torringa, E. J. H. Van Delden, and R. T. Schorr, all of The Hague, all in Holland.
447,733. **Vehicle Spring Suspension.** Auto Union A. G., Chemnitz, Germany.
447,746. **Boot Machine.** M. L. Dodge, Newburyport, Mass., U. S. A.
447,795. **Ball.** H. D. Scotton, London.
447,799. **Arch Support.** J. May, Frankfurt a.M., Germany.
447,802. **Hair Waver.** G. Wenter, Budapest, Hungary.
447,872. **Hinge.** Colaert Freres, Nord, France.
447,889. **Mop.** R. Leistner and C. O. Schmidt, both of Berlin, Germany.
447,903. **Manicure Appliance.** J. P. Gowland, Chobham.
447,907. **Brake Block.** J. Doherty & Son, Ltd., J. Doherty, and F. C. Tickell, all of Birmingham.
447,943. **Hair Waver.** P. Sartory, London.
447,951. **Foundation Garment.** P. H. Robbins, New York, N. Y., U. S. A.
447,958. **Gramophone Pick-Up.** R. G. Johnson, Edinburgh, Scotland. (E. N. Johnson, Johannesburg, South Africa.)
447,982. **Cylinder.** Automotive Products Co., Ltd., and F. V. Brown, both of London.

Germany

636,733. **Rubber Spring for Motor Vehicles.** P. Henss, Salzerhelden, Kr. Einbeck.
637,158. **Tube for Vehicles.** H. Schultz, Willenberg, Ostpr.
637,163. **Tennis Ball.** Deutsche Dunlop Gummi-Co. A.G., Hanau a.M.
637,395. **Air Cushion.** E. Manger, Rudolstadt, Thur.

TRADE MARKS

United States

338,306. **Cres Flex.** Nonmetallic sheathed cables. Crescent Insulated Wire & Cable Co., Trenton, N. J.
338,307. **Endurite.** Rubber insulation for electrical conductors and wire cables. Crescent Insulated Wire & Cable Co., Trenton, N. J.
338,311. **Top Hat.** Surgical gloves, hot water bottles, and syringes, V. R. Vogt, doing business as V. R. Vogt & Co., Des Moines, Iowa.
338,362. **Hollandex.** Waterproof surgical fabrics. Holland Rantos Co., Inc., New York, N. Y.
338,397. **DresSaver.** Back and underarm shields. R. Krantz, doing business as Dressaver Co., Brooklyn, N. Y.
338,461. **King Kord.** Bicycle tires. Monark Silver King, Inc., Chicago, Ill.
338,505. Fanciful label containing the words: **"Paranu. New Life to Rubber. Rubber Matting, Auto Tires, Running Boards, Floor Mats."** Paste products for rejuvenating and cleaning tires, running boards, floor mats, matting, etc. F. T. Jamieson, Cleveland, O.
338,517. **Fashion Con-Trolette.** Corsets, corselets, girdles, and brassieres. Fashion Brassiere Co., Inc., New York, N. Y.
338,530. Representation of an electric light bulb. Heels and soles. Bradstone Rubber Co., Woodbine, N. J.
338,551. Representation of a shield containing the word: **"Trojan."** Rubber packing, etc. Degen-Fiege Belting Co., Los Angeles, Calif.
338,561. **Dandee.** Combs. Bolta Rubber Comb Sales Corp., New York, N. Y.
338,571. **Palisade.** Hose. New York Belting & Packing Co., New York, N. Y.
338,587. **Armorubber.** Tires. Kelly-Springfield Tire Co., Cumberland, Md.
338,618. **Matador.** Combs. Vereinigte Gummiwaren-Fabriken Wimpassing Vormals Menier-J. N. Reithoffer, Vienna, Austria.
338,648. Label containing representation of an Arab on horseback, and the word: **"Sheik."** Prophylactic rubber articles. Julius Schmidt, Inc., New York, N. Y.
338,691. **Wilco.** Rubber gloves. Wilson Rubber Co., Canton, O.
338,752. **Cymbal.** Brassieres, corsets, pantie girdles, girdles, garter belts, etc. Maiden Form Brassiere Co., Inc., New York, N. Y.
338,754. Representation of a knight below the words: **"Lady Defender."** Combination slips and dress shields. Mitchell Bros., Inc., New York, N. Y.
338,756. **Sculpturesque.** Corselets and girdles. Schleisner Co., Inc., Baltimore, Md.
338,800. **oSo-Fast.** Bungs. Rubbercraft Corp. of California, Ltd., Los Angeles, Calif.
338,858. **Dentalastic.** Teeth cleaning elastic tape. J. O. Van Gilder, Columbus, O.
338,868. **Aquatam.** Ladies' beach and sport hats. I. B. Kleinert Rubber Co., New York, N. Y.
338,919. **Ho-Hum.** Rubber swimming and beach mattresses. United States Rubber Products, Inc., New York, N. Y.

FINANCIAL[1]

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges. Most of the figures are subject to year-end adjustments.

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y. First nine months of 1936: net income, $2,803,266, equal to $1.11 each on 2,520,368 shares of $10-par combined Class A and Class B common stock outstanding, excluding shares held by subsidiaries. No mention was made of provision for federal surtax on undistributed earnings. In the corresponding period of 1935 net income was $2,533,969, or $1 a share on combined common shares.

American Zinc, Lead & Smelting Co., Columbus, O., and subsidiaries. Nine months ended September 30: net loss, before federal surtax on undistributed profits, $41,084, compared with $158,241 loss last year. Net loss for September quarter, $8,448, contrasted with net profit in preceding quarter of $10,669, or 14¢ a share on 75,000 shares of prior preferred stock, and net loss of $58,799 in third quarter of 1935. Twelve months ended September 30: net loss, $67,314.

Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y., and subsidiaries. Third quarter of 1936: net income, $764,266, equivalent to $1.81 each on 421,981 shares of capital stock. In the preceding quarter, the net income was $632,148, or $1.50 a share. Earnings in the third quarter of 1935 were $213,094, or 50¢ a share.

Columbian Carbon Co., 41 E. 42nd St., New York, N. Y., recently declared a special dividend of $1.25 and the regular quarterly of $1. A payment of $50 to each employe with the company since July 1, 1936, was also voted by the directors. With the current declaration dividends for 1936 will total $5.75 a share, compared with $4.40 last year.

Columbian Carbon and subsidiaries. Nine months ended September 30 (preliminary report): net earnings, $2,654,104 after depreciation, depletion, federal income taxes and other charges but before provision for federal surtax on undistributed profits. Earnings are equivalent to $4.94 a share, based on 537,411 shares outstanding on September 30, 1936. In the first nine months of 1935 the company earned $2,127,787, or $3.96 a share on 537,681 shares.

Commercial Solvents Corp., 230 Park Ave., New York, N. Y. Quarter ended September 30: net income, $583,452, after depreciation and federal taxes, but before surtax on undistributed profits, equal to 22¢ a share on 2,636,878 no par capital shares, against $466,170, or 18¢ a share on 2,636,699 capital shares in the preceding quarter and $504,867, or 19¢ a share on 2,636,258 capital shares in September, 1935, quarter. Nine months ended September 30: net income, $1,667,400, or 63¢ a share, against $1,604,522, or 61¢ a share in same period last year.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Directors on November 16 declared a year-end dividend of $2 a share on the common stock, payable December 15 to holders of record on November 25. Regular quarterly dividends of 90¢ a share were paid in the last three quarters of this year. In May and August the company declared two extra dividends of 70¢ each. In the same period of 1935 the company voted a dividend of 90¢ each on the common shares, besides a distribution of 200,000 shares of General Motors common stock which was held as a temporary investment by du Pont. The latest disbursement was voted partly as a result of the receipt of a dividend of about $62,250,000 from General Motors Corp.

Electric Hose & Rubber Co., 1201 Dure St., Wilmington, Del. Year ended August 31: net income, $55,346, equal to $4.34 a share on 12,741 capital shares, against $43,376, or $3.40 a share, in preceding year.

Flintkote Co., East Rutherford, N. J., and subsidiaries. Forty weeks ended October 10: net income, $944,881, against $1,094,488 for forty weeks ended October 5, 1935. After eliminating extraordinary income received in settlement of patent infringements and other claims, profit was $939,126, equal to $1.41 each on 668,046 combined Class A and B shares, against $991,169, or $1.48 a share. Twelve weeks ended October 10: net income, $473,482, or 71¢ a share, against $469,555, or 70¢ a share in twelve weeks ended October 5, 1935.

Freeport Texas Co., 122 E. 42nd St., New York, N. Y. Quarter ended September 30: net income after all charges, including depreciation, depletion, and federal taxes, amounted to $495,637.79, equivalent to 60¢ a share on the 796,371 shares of common stock, after provision for dividends on the preferred stock. This compares with earnings of $334,321.21, or 40¢ a common share for the third quarter of 1935. First nine months of 1936: net income, $1,510,510.54, or $1.82 per share on the common stock, as against $889,641.05, or $1.05 a share for the same period a year ago. It was said no provision has been made to cover surtax on undistributed net income and that the figures, in each instance, reflect the company's share of the losses of Cuban-American Manganese Corp. At a meeting of directors on October 22 a quarterly dividend of 25¢ per share was declared on the common stock, payable December 1, to stockholders of record November 18. A quarterly dividend of $1.50 a share on the 12,301 shares of preferred stock also was voted, payable February 1, 1937, to stockholders of record January 15, 1937.

Monsanto Chemical Co., St. Louis, Mo., and subsidiaries. Nine months ended September 30: net profit, $3,290,721 before subsidiary preferred dividends and provision for possible federal surtax on undistributed income, equal after subsidiary preferred dividends to $2.89 each on 1,114,410 shares of $10-par capital stock. In first nine months of 1935 net profit on same basis was $2,808,687, or $2.76 each on 987,876 shares. Quarter ended September 30: net profit, $1,181,125, or $1.04 a share, on 1,114,410 shares. In preceding quarter balance was $1,035,730, equal to 93¢ a share on same number of shares, and in September quarter last year, $884,550, or 89¢ each on 987,876 shares. Sales and earnings in third quarter constituted an all-time peak.

New Jersey Zinc Co., 160 Front St., New York, N. Y. First nine months of 1936: net income, $3,593,585, equal to $1.83 each on 1,963,264 shares of $25 par capital stock. No mention was made of federal surtax on undistributed profits. For the similar period last year the company earned $3,342,216, or $1.70 a capital share. Net income for the third quarter, after deductions, was $1,253,813, or 64¢ a share, against $1,265,593, also 64¢ a share in the June quarter, and $1,168,003, or 59¢ a share, in the September quarter of 1935.

Raybestos-Manhattan, Inc., Passaic, N. J. Nine months ended on September 30: net profit, $1,461,525, equal to $2.30 each on 635,200 shares of capital stock, excluding 40,812 shares held in treasury. This compares with $1,108,902, or $1.75 a share, in nine months a year before. On November 18 after the directors declared a special as well as the usual quarterly dividend they also authorized the payment of one week's salary to every one continually in the company's employ since January 1, 1936, and half a week's pay to those employed since July 1.

United Carbon Co., Charleston, W. Va., and subsidiaries. Nine months ended September 30: net profit, $1,574,964, equal to $3.96 each on 397,885 no-par common shares, against $1,363,721, or $3.43 a share, last year. Net profit for the third quarter of 1936 amounted to $487,358, or $1.23 a share, compared with $519,776, or $1.13 a share in the second quarter, and $425,752, or $1.07 a share, in the third quarter of the preceding year.

[1] Dividends Declared on page 86.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

GRADUATE CHEMIST, WITH SEVEN YEARS' EXPERIENCE compound and development and factory control. Employed at present, desire to broaden opportunities either in factory technical field or sales development. Address Box No. 740, care of INDIA RUBBER WORLD.

WANTED: A POSITION AS A FOREMAN IN MILL ROOM AND calender. Have 20 years' experience in mechanicals, tires, and footwear. Reference if desired. Address Box No. 741, care of INDIA RUBBER WORLD.

ADVERTISING MANAGER, OVER TWENTY YEARS' experience specializing in advertising of all kinds of mechanical rubber goods, desires permanent connection. Moderate salary to start. Address Box No. 744, care of INDIA RUBBER WORLD.

LATEX CHEMIST, B.S. SEVEN YEARS' EXPERIENCE IN RESEARCH, development, and process control of dipping, spreading, and spraying of latex. Desires change. Address Box No. 746, care of INDIA RUBBER WORLD.

SUPERINTENDENT OR FACTORY MANAGER WITH 15 YEARS' experience in the production of tires, mechanicals, press goods, oil resisting stocks, hard rubber, composition soles and heels, sponge rubber, soft printers' rolls, rubber covered rolls, hose and belting, a producer who can help. Unqualified references as to ability and character. Address Box No. 747, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST, EXECUTIVE TYPE, NOW EMPLOYED, desires position of responsibility in large or small plant. Years of practical experience in development, compounding, and production of mechanicals, tires, tubes, etc. Also practical knowledge of reclaiming. Address Box No. 748, care of INDIA RUBBER WORLD.

PRODUCTION SUPERINTENDENT—15 YEARS' MECHANICAL rubber goods, large and small companies. Capable compounder, knows costs and factory management. References good. Address Box No. 751, care of INDIA RUBBER WORLD.

RUBBER CHEMIST—M.I.T. GRADUATE. EIGHT YEARS' EXperience compounding, development, research. Mechanicals, thread, latex dipped goods. Address Box No. 752, care of INDIA RUBBER WORLD.

FOSTER D. SNELL, INC.
Chemists—Engineers
Every form of Chemical Service
305 Washington Street **Brooklyn, N. Y.**
215 N. Calvert Street, Baltimore, Maryland

I have carried on a Rubber Technical and Experimental Service for over thirty years. May I not serve you?
FREDERICK J. MAYWALD, F.C.S.
309 Hoboken Road **Carlstadt, N. J.**

SITUATIONS OPEN

WANTED: SALES MANAGER EXPERIENCED IN THE SALE OF composition floors and sponge rubber goods. Only those fully experienced need apply. Reply giving age and full details of experience. Address Box No. 742, care of INDIA RUBBER WORLD.

WANTED: A CHEMIST WHO IS FAMILIAR WITH compounding latex for the shoe and leather trade. Or one who is familiar with substitutes for latex, for adhesive operations. Address Box No. 743, care of INDIA RUBBER WORLD.

WANTED: BY LARGE TIRE MANUFACTURER. ONE HIGHEST caliber tire construction expert, especially truck tires. All details of experience and salary in letter. Company employes know of this advertisement. Address Box No. 749, care of INDIA RUBBER WORLD.

A MANUFACTURER OF HIGH-GRADE MECHANICAL RUBBER GOODS

will pay a very liberal salary to a man with considerable following in New York Metropolitan district and another in Philadelphia who can, in a short time, demonstrate their selling ability. This advertisement is known to the members of this organization. Address Box No. 750, care of INDIA RUBBER WORLD.

"COMPOUNDING INGREDIENTS FOR RUBBER"

By the Editors of
INDIA RUBBER WORLD

$2.50 Postpaid in U. S. A.
$2.75 Elsewhere

A comprehensive presentation of outstanding ingredients, their composition, physical state, properties, applications and functions.

Completely revised. Over 200 pages, cloth bound, fully indexed and in convenient pocket size, 5″x7″.

INDIA RUBBER WORLD
420 LEXINGTON AVE. **NEW YORK**

In addition to our purchases of this month of

FOWLER-UNION CO., Buffalo, N. Y.
BRUNSWICK RADIO CO., Muskegon, Mich.
INDIA TIRE CO., Mogadore, Ohio

We offer a complete line of guaranteed rubber machinery including

MILLS
CALENDERS
TUBERS
WASHERS
CRACKERS
REFINERS
HYD. PRESSES
HYD. VULCANIZERS
MOTORS
PUMPS
CUTTERS
LABORATORY EQUIPMENT

L. ALBERT & SON

Offices and Warehouses
336 Whitehead Road, Trenton, N. J. Adams, Arch and Union Streets, Akron, O.
European Office and Representative—Mr. Andre Berjonneau, #33 Blvd. des Batignolles, 33, Paris (VII), France

(*Advertisements continued on page* 85)

Tire Production Statistics

	Pneumatic Casings—All Types			Solid and Cushion Tires		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1934	9,454,985	47,232,748	46,686,545	34,710	197,497	187,152
1935	8,195,863	49,361,781	50,183,129	46,406	283,606	275,741
1936						
Jan.	8,916,673	4,578,179	3,874,523	40,193	25,443	22,670
Feb.	9,263,261	3,577,103	3,210,789	.....	14,730	17,172
Mar.	9,085,790	3,637,625	3,855,527	.....	16,004	21,350
Apr.	9,032,925	4,853,346	4,901,895	.....	32,807	32,611
May	8,174,806	4,970,388	5,831,641	.....	29,674	30,378
June	7,831,474	5,609,095	5,791,579	.....	36,856	35,617
July	7,746,388	5,464,927	5,743,863	.....	38,904	34,445
Aug.	7,793,438	5,014,415	4,976,383	.....	33,649	28,174
Sept.	9,005,065	4,981,131	3,835,998	.....	40,801	36,312

	Inner Tubes—All Types		
1934	9,179,893	46,227,807	45,045,495
1935	8,231,351	47,879,034	48,066,904
1936			
Jan.	8,622,522	4,591,791	4,167,711
Feb.	8,699,228	3,556,098	3,445,767
Mar.	8,691,651	3,787,226	3,795,505
Apr.	8,788,043	4,824,199	4,746,265
May	8,719,467	4,818,960	4,918,715
June	8,104,830	5,034,595	5,503,564
July	7,724,790	5,177,430	5,758,273
Aug.	7,620,573	5,038,785	5,136,005
Sept.	8,626,648	5,160,815	4,230,546

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1934	196,069,495	697,558,218	17,063,298,000
1935	202,318,119	756,773,779	18,167,352,000
1936			
Jan.	15,987,906	61,457,999	1,367,226,000
Feb.	12,059,051	45,839,772	1,150,842,000
Mar.	13,416,664	47,872,526	1,506,582,000
Apr.	16,570,836	64,211,819	1,630,650,000
May	17,098,812	66,119,211	1,764,294,000
June	18,494,366	69,251,427	1,874,460,000
July	18,250,725	69,637,586	1,961,064,000
Aug.	17,151,577	64,998,596	1,935,402,000
Sept.	16,988,854	63,671,252	1,862,532,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 1935, 81% for 1936, and 80% for previous years, with the exception of gasoline consumption.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalgar Sq., London, W.C.2, England, gives the following figures for October, 1936:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	2,370	342
United States	32,457	572
Continent of Europe	6,337	243
British possessions	1,805	37
Japan	1,306	23
Other countries	1,043	8
Totals	45,318	1,225

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	3,312	1,374
Dutch Borneo	1,800	5
Java and other Dutch islands	463	3
Sarawak	2,010	..
British Borneo	485	29
Burma	181	4
Siam	2,010	925
French Indo-China	110	108
Other countries	124	17
Totals	10,495	2,465

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.	Australia	Belgium	Canada	Czechoslovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1934	439,100	158,500	9,600	9,100	28,400	11,000	50,400	59,300	21,400	69,900	47,300	60,500	964,500
1935	455,757	128,829	9,977	7,593	26,868	11,225	52,322	62,901	23,916	57,589	37,576	56,725	931,278
1936													
Jan.	33,260	4,573	1,260	760	1,758	767	6,770	5,545	1,500*	4,357	467	5,121	66,138
Feb.	33,789	1,271	735	779	1,900	344	6,288	5,257	1,000*	3,305	94	5,268	60,030
Mar.	33,743	1,227	819	1,033	1,809	410	4,342	4,568	1,000*	5,172	4,376	5,433	61,478
Apr.	44,949	2,097	969	1,097	1,079	603	4,261	5,497	1,500*	4,931	3,251	4,723	70,763
May	35,549	302	1,053	698	2,221	667	4,342	4,639	1,000*	5,531	4,220	4,380	64,602
June	35,901	1,493	1,693	579	2,042	323	4,860	5,698	1,500*	4,567	2,427	4,176	62,273
July	38,556	766	1,455	713	2,274	495	4,631	6,837	2,000*	5,126	1,733	4,532	67,586
Aug.	41,094	1,581	762	789	3,780	989	4,522	6,556	1,500*	4,305	3,000*	4,309	70,025

* Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	9 Mos., 1936 No.	%	9 Mos., 1935 No.	%
Drop Center Rims, 16" Diameter and under				
15x5.50E	1,532	0.0	10	0.0
16x4.00D	5,455	0.0	1,508,096	11.3
16x4.25D	178,650	1.2	1,036,885	7.8
16x4.50D	33,753	0.2	263,533	2.0
16x5.00E	.....	...	13,739	0.1
16x5.50E	.....	...	9,063	0.1
16x6.00E	77	0.0	.....	...
15x3.00D	26,952	0.2	.....	...
15x5.00F	11,828	0.1	.....	...
15x5.50F	113,294	0.8	67,047	0.5
16x3.00D	385	0.0	.....	...
16x3.50D	1,088	0.0	.....	...
16x4.00E	5,585,434	37.7	2,141,459	16.1
16x4.25E	317,578	2.1	26,325	0.2
16x4.50E	2,050,889	13.8	1,995,148	15.0
16x5.00F	601,582	4.1	75,323	0.6
16x5.50F	62,019	0.4	4,674	0.0
16x6.00F	10,304	0.1	.....	...
Drop Center Rims, 17" Diameter and over				
17x3.00D	102,445	0.7	1,104,617	8.3
17x3.25E	488,614	3.0	553,212	4.2
17x3.62F	2,160,823	14.6	1,455,778	11.0
17x4.00F	14,859	1.0	45,508	0.3
17x4.19F	4,008	0.0	18,541	0.1
17x5.00F	4,456	0.0	1,904	0.0
18x2.15B	42,742	0.3	15,002	0.1
18x3.00D	646	0.0	14,264	0.1
18x3.25E	8,349	0.1	13,258	0.1
18x3.62F	4,928	0.0	.....	...
18x4.00F	1,221	0.0	21	0.0
18x4.19F	18,538	0.1	14,134	0.1
19x2.15B	5,727	0.0	11,631	0.1
19x3.00D	8,311	0.1	18,499	0.1
19x3.25E	12,048	0.1	12,113	0.1
20x3.25E	12,159	0.1	8,513	0.1
21x3.25E	4,693	0.0	2,869	0.0
Flat Base Passenger Car Rims				
17x3.25E	10,101	0.1	.....	...
17x4	1,443	0.0	1,276	0.0
17x4½	308	0.0	422	0.0

Rim Size	9 Mos., 1936 No.	%	9 Mos., 1935 No.	%
Flat Base Passenger Car Rims (Cont'd)				
17x5	255	0.0	5,251	0.0
17x6	2,122	0.0	7,010	0.1
18x3.00D	2,442	0.0	.....	...
18x3.25E	499	0.0	708	0.0
18x4	1,436	0.0	1,247	0.0
18x4½	226	0.0	386	0.0
18x5	.....	...	2,382	0.0
19x2.75D	3,235	0.0	5,263	0.0
19x3.00D	1,559	0.0	2,080	0.0
19x3½	72	0.0	.....	...
19x4	2,949	0.0	4,446	0.0
19x4½	1,338	0.0	1,227	0.0
19x5	506	0.0	511	0.0
19x6	.....	...	27	0.0
20x2.75D	2,923	0.0	2,498	0.0
20x3½	315	0.0	2,637	0.0
20x4	1,337	0.0	634	0.0
20x4½	3,577	0.0	2,930	0.0
20x5	711	0.0	12,809	0.1
20x6	.....	...	107	0.0
21x2.75D	2,714	0.0	748	0.0
21x3½	6,101	0.0	10,513	0.1
21x4	933	0.0	1,221	0.0
21x4½	1,091	0.0	3,395	0.0
High Pressure Passenger Rims				
All sizes	1,273	0.0	1,777	0.0
15" Truck Rims				
15x7	4,715	0.0	.....	...
15x8	1,135	0.0	.....	...
18" Truck Rims				
18x5	524	0.0	177	0.0
18x6	2,389	0.0	721	0.0
18x7	31,426	0.2	18,066	0.1
18x8	1,859	0.0	1,470	0.0
18x9/10	3,170	0.0	.....	...
20" Truck Rims				
20x5	965,498	6.5	1,293,540	9.7
20x6	1,193,734	8.1	1,085,338	8.2
20x7	337,259	2.3	166,250	1.3

Rim Size	9 Mos., 1936 No.	%	9 Mos., 1935 No.	%
20" Truck Rims (Cont'd)				
20x8	125,364	0.8	77,925	0.6
20x9/10	14,533	0.1	7,803	0.1
20x10.50	688	0.0	.....	...
20x11	1,118	0.0	720	0.0
22" Truck Rims				
22x7	177	0.0	1,090	0.0
22x8	13,142	0.1	9,776	0.1
22x9/10	6,261	0.0	5,419	0.0
24" Truck Rims				
24x6	2,518	0.0	1,967	0.0
24x7	9,575	0.1	9,421	0.1
24x8	14,608	0.1	14,875	0.1
24x9/10	10,253	0.1	4,514	0.0
24x11	2,732	0.0	1,776	0.0
Drop Center Tractor Rims				
24x6.00S	4,320	0.0	2,577	0.0
24x8.00T	40,657	0.3	32,201	0.2
28x6.00S	1,385	0.0	157	0.0
28x8.00T	25,293	0.2	11,573	0.2
32x6.00S	1,052	0.0	.....	...
32x8.00T	3,348	0.0	693	0.0
36x6.00S	41,948	0.3	30,003	0.2
36x8.00T	8,945	0.1	4,382	0.0
40x6.00S	4,264	0.0	401	0.0
40x8.00T	174	0.0	190	0.0
20x4.50E	547	0.0	.....	...
20x5.00F	21	0.0	.....	...
36x3.00D	594	0.0	.....	...
36x4.50E	394	0.0	.....	..
Cast Wheels				
10x5.00F	1,413	0.0	3,459	0.0
10x6.00F	451	0.0	.....	...
24x11.25Y	.....	...	182	0.0
24x15Y	463	0.0	.....	...
Clincher Rims				
All sizes	4,366	0.0	4,054	0.0
Airplane Rims				
All sizes	1,224	0.0	2,425	0.0
Totals	14,827,117	...	13,295,816	...

Genasco (M.R.) Hydrocarbon
(SOLID OR GRANULATED)
A hard, stable compound—produced under the exacting supervision of an experienced and up-to-date laboratory. Aging tests have proved Genasco to be *always* of uniform quality. Shipped to all parts of the world in metal drums. Stocks carried at Maurer, N. J., and Madison, Ill.
THE BARBER COMPANY, INC.
Philadelphia New York Chicago St. Louis

We Have a Completely Equipped Plant for Manufacturing
Rubber Specialties
Backed by years of experience.
Let us quote on your requirements without obligation, of course.
ADMIAR RUBBER CO.
273 Van Sinderen Ave., Brooklyn, N. Y.

Classified Advertisements

Continued

BUSINESS OPPORTUNITIES

PART INTEREST AVAILABLE TO CAPABLE MANAGER SMALL rubber tubing and specialty plant. Chamber of Commerce, Alliance, Ohio.

FOR SALE OR RENT: RUBBER PLANT NEAR PHILADELPHIA fully equipped for operating, machinery, presses, calenders, new boiler, artesian well, etc.; 9,000 square feet in building. An opportunity. Wynne James, Jr., Doylestown, Pa.

WILL INVEST $15,000 IN SMALL MECHANICAL PLANT. EXperienced in hard rubber mechanicals, etc. Successful record in production, development, sales, and management. Address Box No. 745, care of INDIA RUBBER WORLD.

FOR RENT
Small rubber plant located in New York City with three mills in good condition and two pot vulcanizers at a very reasonable rental. Address Box No. 753, care of INDIA RUBBER WORLD.

New and Used
RUBBER MACHINERY
M. NORTON & COMPANY
MEDFORD MASS.

Precipitated Surinam Balata
for Golf Ball Manufacturers. 99 and 54/100 per cent free from resins. Purer and cheaper than you can produce it. You also avoid fire hazards.
Sample and price on request.
HUNTINGDON MANUFACTURING CO. Meadowbrook, Pa.

MECHANICAL MOLDED RUBBER GOODS
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

CORONA GOLF BALL WINDING MACHINES
Used everywhere by manufacturers. Rented on a monthly basis in U. S. Sold outright in foreign countries.
Illustrated circular on request.
Corona Manufacturing Company
Mount Airy, Philadelphia, Pa., U. S. A.

For Flat Stationary or Moving Curved Surfaces
Surface Temperatures
Use the "Alnor" Pyrocon
Ideal for rolls, molds, plates, platens and plastic material temperatures.
Write for bulletin.
ILLINOIS TESTING LABORATORIES, Inc.
434 N. La Salle Street Chicago, Illinois

HYDRAULIC VALVES

Operating, Globe, Angle, or Check Valves—Hydraulic Presses, Accumulators, Pumps, etc. —For almost any size or pressure.
Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

GUAYULE RUBBER
Washed and Dry, Ready for Compounding
PLANTATION RUBBER
From Our Own Estates in Sumatra
CONTINENTAL RUBBER COMPANY OF NEW YORK
745 Fifth Avenue New York

DUPHAX—FOR DU PRENE*
Reg. U.S. Pat. Off.
"DU PRENE can be loaded with FACTICE and fillers to a greater extent than rubber and yet retain its rubber-like properties to a remarkable degree. Such stocks tube smoothly and rapidly, calender nicely at low heats and, when vulcanized, give snappy, rubbery stocks."
Reg. U.S. Pat. Off.
THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.
Makers of FACTICE Since 1900
* A Registered Trade Mark of DuPont Reg. U.S. Pat. Off.

(*Advertisements continued on page 87*)

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	June, 1936		Three Months Ended June, 1936	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude rubber, etc.	4,574,180	$718,079	11,964,764	$1,853,645
Gutta percha	100	115	2,371	462
Rubber, recovered	1,163,800	45,498	2,483,000	110,255
Rubber, powdered, and gutta percha scrap	271,500	2,440	1,013,800	15,796
Balata	1,476	473	2,924	811
Rubber substitute	37,200	9,650	94,000	29,117
Totals	6,048,256	$776,255	15,560,859	$2,010,086
PARTLY MANUFACTURED				
Hard rubber	7,831	$5,485	19,898	$11,998
Hard rubber tubes	.....	267	.....	1,238
Rubber thread not covered	2,714	1,838	10,121	6,684
Totals	10,545	$7,590	30,019	$19,920
MANUFACTURED				
Hard rubber comb blanks	.....	$178	.....	$255
Belting	.....	6,546	.....	19,154
Hose	.....	6,316	.....	22,555
Packing	.....	4,801	.....	14,986
Boots and shoes, *pairs*	10,423	2,418	71,154	17,916
Canvas shoes with rubber soles, *pairs*	29,630	9,909	102,320	36,967
Clothing, including waterproofed	.....	2,682	.....	8,419
Raincoats, *number*	234	1,440	3,950	13,273
Gloves, *dozen pairs*	324	825	1,055	2,694
Hot water bottles	.....	736	.....	1,208
Liquid rubber compound	.....	3,202	.....	8,669
Tires, bicycle, *number*	12,599	3,626	28,203	9,805
Pneumatic, *number*	1,879	20,185	5,052	49,266
Inner tubes, *number*	791	1,412	2,033	3,094
Solid for automobiles and motor trucks, *number*	5	55	75	1,866
Other solid tires	.....	469	.....	2,463
Mats and matting	.....	6,974	.....	22,714
Cement	.....	3,906	.....	20,944
Golf balls, *dozens*	6,278	16,684	18,002	47,044
Heels, *pairs*	5,946	324	17,665	955
Other rubber manufactures	.....	96,607	.....	261,964
Totals	.....	$189,295	.....	$566,211
Totals, rubber imports	.....	$973,140	.....	$2,596,217

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$12,611	.....	$25,372	.....
MANUFACTURED				
Belting	$44,281	.....	$124,204	.....
Canvas shoes with rubber soles	96,470	.....	425,558	.....
Boots and shoes	224,734	.....	505,442	.....
Clothing, including waterproofed	25,568	.....	64,589	.....
Heels	14,034	.....	43,957	.....
Hose	18,676	.....	52,400	.....
Soles	11,216	.....	38,071	.....
Tires, pneumatic	551,488	.....	1,734,096	.....
Not otherwise provided for	2	.....	25	.....
Inner tubes	51,370	.....	154,557	.....
Other rubber manufactures	57,673	$1,497	150,710	$4,287
Totals	$1,095,512	$1,497	$3,293,609	$4,287
Totals, rubber exports	$1,108,123	$1,497	$3,318,981	$4,287

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
†1,788	Rubber horseshoes	Athens, Greece
†1,802	Women's footwear	Johannesburg, South Africa
†1,840	Bathing caps and surgical goods	Rio de Janeiro, Brazil
‡1,845	Soles	Bogota, Colombia
†1,883	Rubber articles	Mayaguez, Puerto Rico
*1,887	Tire repair machines and retreaders	Habana, Cuba
*1,919	Rubber colored pennants	Amsterdam, Netherlands
*1,920	Scrap rubber	Montreal, Canada
*1,921	Belting scrap	Oran, Algeria
§1,938	Offset printing blankets	Prague, Czechoslovakia
*1,943	Corselet rubberized fabrics	Prague, Czechoslovakia
*1,986	Statuary reproducing rubber molds	Moncton, Canada
†1,998	Babies' knickers	Cairo, Egypt

*Purchase. †Agency. ‡Exclusive agency. §Purchase and agency.

Rubber Goods Production Statistics

		1936	1935
TIRES AND TUBES*		Aug.	Aug.
Pneumatic casings			
Production	*thousands*	4,062	3,234
Shipments, total	*thousands*	4,031	3,839
Domestic	*thousands*	3,978	3,783
Stocks, end of month	*thousands*	6,313	6,322
Solid and cushion tires			
Production	*thousands*	34	26
Shipments, total	*thousands*	28	24
Domestic	*thousands*	28	24
Stocks, end of month	*thousands*	42	33
Inner tubes			
Production	*thousands*	4,081	3,154
Shipments, total	*thousands*	4,160	3,590
Domestic	*thousands*	4,125	3,647
Stocks, end of month	*thousands*	6,173	5,621
Raw material consumed			
Fabrics	*thous. of lbs.*	17,152	13,836
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	*thous. of lbs.*	186	276
Rubber-proofed fabrics, production, total	*thous. of yds.*	4,514	5,209
Auto fabrics	*thous. of yds.*	370	427
Raincoat fabrics	*thous. of yds.*	1,842	2,370
Rubber flooring, shipments	*thous. of sq. ft.*	614	477
Rubber and canvas footwear			
Production, total	*thous. of prs.*	5,588	4,699
Tennis	*thous. of prs.*	1,377	1,056
Waterproof	*thous. of prs.*	4,212	3,643
Shipments, total	*thous. of prs.*	6,877	6,132
Tennis	*thous. of prs.*	1,443	1,340
Waterproof	*thous. of prs.*	5,435	4,792
Shipments, domestic, total	*thous. of prs.*	6,851	6,106
Tennis	*thous. of prs.*	1,420	1,322
Waterproof	*thous. of prs.*	5,431	4,784
Stocks, total, end of month	*thous. of prs.*	16,626	15,653
Tennis	*thous. of prs.*	3,615	4,156
Waterproof	*thous. of prs.*	13,010	11,497

*Data for January to July, 1935, are estimated to represent approximately 97% of the industry; for August, September, October, November, and December, 1935, the coverage is estimated to be 81%.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
2214	Supplier of latex.
2215	Supplier of sponge rubber.
2216	Who can rubber coat wire baskets by dipping.
2217	Supplier of leather dust suitable for rubber compounding.
2218	English makers of gutta percha products.
2219	Manufacturer of sponge rubber automobile mats.
2220	Manufacturer of vulcanizing equipment for repairing rubber boots and shoes.
2221	Manufacturer of rubber bags used on hat blocking machinery.
2222	Manufacturer of rubber bands.
2223	Manufacturer of rubber tip to fit over a 5/8-inch-diameter opening of a mucilage bottle.
2224	Source of supply of rubber compound R M 347.
2225	Manufacturer of conveying machinery.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Anaconda Wire & Cable Co.	Com.	$0.50 q.	Nov. 1	Nov. 9
Anaconda Wire & Cable Co.	Com.	$1.00, extra	Nov. 16	Nov. 9
Baldwin Rubber Co.	Com.	$0.12½ q.	Dec. 21	Dec. 14
Baldwin Rubber Co.	Com.	$0.50, extra	Dec. 21	Dec. 14
Boston Woven Hose & Rubber Co.	Pfd.	$3.00, s. a.	Dec. 15	Dec. 1
Canada Wire & Cable Co.	6½% Pfd.	$2.75, accum.	Dec. 23	Dec. 1
Firestone Tire & Rubber Co.	Com.	$0.50, inc.	Nov. 20	Nov. 15
Firestone Tire & Rubber Co.	Pfd.	$1.50 q.	Dec. 1	Nov. 15
Fisk Rubber Corp.	Pfd.	$3.00, resumed	Dec. 1	Nov. 16
B. F. Goodrich Co.	$5 Cum. Pfd.	$1.25	Dec. 31	Dec. 10
Goodyear Tire & Rubber Co.	$5 Pfd., New	$4.25, accum.	Dec. 26	Dec. 18
Mid-West Rubber Reclaiming Co.	$4 Pfd.	$1.00 q.	Dec. 1	Nov. 20
Raybestos-Manhattan, Inc.	Com.	$0.37½ q.	Dec. 15	Nov. 30
Raybestos-Manhattan, Inc.	Com.	$0.25, extra	Dec. 15	Nov. 30
Super Mold Corp.	Com.	$0.20, initial	Nov. 15	Nov. 2

Rhode Island Rubber Club

The winter meeting of the Rhode Island Rubber Club will be held at the Narragansett Hotel, Providence, December 11, at 7:00 p.m. Dr. Royce J. Noble, well-known consultant, will speak on "Recent Developments in Latex Technology;" and Dr. Lester Round, former health officer and state criminologist for Rhode Island, will discuss "The Use of Scientific Methods in the Detection of Crime." There will be competitive bowling at the Washington Alleys from 4:30 to 6:30, with prizes for lucky winners.

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Classified Advertisements

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United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	August, 1936		Eight Months Ended August, 1936	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	89,660,358	$13,364,916	656,349,512	$91,407,101
Liquid latex	3,944,962	602,992	29,029,710	4,152,387
Jelutong or pontianak	719,582	64,769	9,742,901	907,509
Balata	160,784	23,715	986,678	158,052
Gutta percha	122,554	14,530	2,442,483	399,637
Guayule	327,900	37,147	1,602,400	144,776
Siak, scrap, reclaimed, etc.	814,558	18,844	8,958,483	204,460
Totals	95,750,698	$14,126,913	709,112,167	$97,373,922
Chicle, crude *Free*	221,081	$47,420	5,137,294	$1,234,796
MANUFACTURED—*Dutiable*				
Rubber tires *number*	2,502	$1,710	54,757	$311,468
Rubber boots, shoes, and overshoes *pairs*	5,221	1,018	42,220	8,604
Rubber soled footwear with fabric uppers *pairs*	94,962	21,819	777,840	169,680
Golf balls *number*	46,224	6,766	467,970	74,432
Lawn tennis balls *number*	2,400	438	385,747	38,602
Other rubber balls *number*	208,966	9,392	3,631,758	115,098
Other rubber toys, except balls	93,693	11,218	789,855	94,770
Hard rubber combs *number*	91,668	5,074	559,466	32,715
Other manufactures of hard rubber	.....	3,463	.....	20,102
Friction or insulating tape	4,721	254	202,792	10,199
Belts, hose, packing, and insulating material	.....	12,784	.....	141,246
Druggists' sundries of soft rubber	.....	3,898	.....	57,728
Inflatable swimming belts, floats, etc. *number*	6,324	480	652,898	35,348
Other rubber and gutta percha manufactures	154,631	26,803	1,011,907	183,724
Totals	.....	$105,117	.....	$1,293,716

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	1,881,661	$307,114	21,940,428	$3,465,297
Balata	5,590	1,488	161,091	42,262
Gutta percha, rubber substitutes, and scrap	24,530	1,223	101,280	6,676
Rubber manufactures	.....	1,474	.....	11,461
Totals	.....	$311,299	.....	$3,525,696

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,382,913	$60,783	10,510,761	$476,789
Scrap	3,534,062	31,456	30,221,698	548,259
Cements *gal.*	20,279	22,274	146,883	124,440
Rubberized automobile cloth, *sq. yd.*	33,998	15,316	344,612	157,993
Other rubberized piece goods and hospital sheeting *sq. yd.*	95,696	40,634	807,967	324,931
Footwear				
Boots *pairs*	4,144	8,711	49,739	110,254
Shoes *pairs*	7,915	5,292	160,113	63,472
Canvas shoes with rubber soles *pairs*	14,428	8,171	140,764	83,486
Soles *doz. prs.*	1,834	3,102	16,415	29,717
Heels *doz. prs.*	36,478	21,634	277,404	174,764
Soling and top lift sheets	28,424	5,467	259,150	52,284
Gloves and mittens *doz. prs.*	4,267	9,639	39,291	89,015
Water bottles and fountain syringes *number*	29,638	10,529	164,285	59,841
Other druggists' sundries	.....	47,994	.....	335,314
Gum rubber clothing *doz.*	23,212	30,460	94,234	152,280
Balloons *gross*	32,654	33,739	202,677	189,658
Toys and balls	.....	10,905	.....	61,219
Bathing caps *doz.*	1,969	3,794	47,564	78,348
Bands	14,631	5,426	161,303	57,817
Erasers	27,246	14,495	249,086	143,623
Hard rubber goods				
Electrical hard rubber goods	.....	21,585	.....	138,365
Other hard rubber goods	.....	18,992	.....	165,832
Tires				
Truck and bus casings, *number*	11,112	215,003	116,173	2,196,174
Other automobile casings, *number*	46,247	432,048	460,790	4,167,645
Tubes, auto *number*	39,824	61,612	421,253	640,093
Other casings and tubes, *number*	5,658	33,972	32,938	145,602
Solid tires for automobiles and motor trucks *number*	377	11,833	3,433	93,046
Other solid tires	90,222	14,470	781,984	121,247
Tire sundries and repair materials	.....	52,919	.....	390,863
Rubber and friction tape	66,259	19,836	460,689	123,362
Belts and belting	197,909	98,944	1,699,035	892,323
Hose	323,426	113,782	3,151,076	1,123,429
Packing	99,837	39,652	945,793	399,759
Mats, matting, flooring, and tiling	127,330	22,679	991,471	138,066
Thread	30,370	16,495	570,397	340,588
Gutta percha manufactures	50,675	17,748	538,491	147,832
Other rubber manufactures	.....	63,862	.....	734,199
Totals	.....	$1,645,253	.....	$15,271,929

Rubber Questionnaire

Second Quarter, 1936*

	Long Tons			
RECLAIMED RUBBER	Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (7)	4,541	16,010	15,824	.....
Manufacturers who also reclaim (16)	4,280	10,999	1,790	10,583
Other manufacturers (100)	4,042	.....	.....	12,797
Totals	12,863	27,009	17,614	23,380

	Long Tons		
SCRAP RUBBER	Inventory	Consumption	Due on Contracts
Reclaimers solely (7)	36,359	17,210	8,750
Manufacturers who also reclaim (15)	22,782	13,823	4,740
Other manufacturers (12)	148	.....	.....
Totals	59,289	31,033	13,490

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

PRODUCTS	Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries		
All types pneumatic casings (except bicycle, airplane)	78,879	$84,078,000
All types pneumatic tubes (except bicycle, airplane)	11,427	11,493,000
Bicycle tires, including juveniie pneumatics (single tubes, casings, and tubes)	723	1,241,000
Airplane tires and tubes	35	133,000
Solid and cushion tires for highway transportation	122	311,000
All other solid and cushion tires	225	412,000
Tire sundries and repair materials	1,566	2,208,000
Totals	92,977	$99,876,000
Other Rubber Products		
Mechanical rubber goods	11,557	$31,669,000
Boots and shoes	4,726	9,567,000
Insulated wire and cable compounds	1,504	†
Druggists' sundries, medical and surgical rubber goods	650	1,711,000
Stationers' rubber goods	507	557,000
Bathing apparel	313	1,036,000
Miscellaneous rubber sundries	806	1,429,000
Rubber clothing	130	453,000
Automobile fabrics	123	551,000
Other rubberized fabrics	1,014	2,609,000
Hard rubber goods	514	1,973,000
Heels and soles	1,889	3,210,000
Rubber flooring	235	410,000
Sponge rubber	780	1,043,000
Sporting goods, toys, and novelties	647	2,100,000
Totals	25,395	$58,318,000
Grand totals—all products	118,372	$158,194,000

Inventory of Rubber in the United States and Afloat

	Long Tons	
	Crude Rubber on Hand	Crude Rubber Afloat
Manufacturers	142,770	6,963
Importers and dealers	82,929	33,303
Totals	225,699	40,266

*Number of rubber manufacturers that reported data was 186; crude rubber importers and dealers, 52; reclaimers (solely), 7; total daily average number of employes on basis of third week of April was 127,873.

It is estimated that the reported grand total crude rubber consumption is 75.8%; grand total sales value, 80%; the grand total crude rubber inventory, 91.8%; afloat figures, unavailable; the reclaimed rubber production 77.5%; reclaimed consumption, 72.4%; and reclaimed inventory, 56.6% of the total of the entire industry.

†Owing to the difficulty of securing representative sales figures this item has been discontinued.

Compiled from statistics supplied by The Rubber Manufacturers Association, Inc.

Imports by Customs Districts

	—September, 1936— *Crude Rubber		—September, 1935— *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	6,553,653	$1,055,437	6,428,194	$728,049
New York	90,303,229	14,243,175	62,766,004	7,026,734
Philadelphia	787,690	118,130	1,339,087	149,498
Maryland	696,760	84,584	1,622,995	183,157
Georgia	659,184	100,214	.....	.....
Mobile	72,681	10,390	1,046,393	108,263
New Orleans	1,254,277	181,970	1,212,008	124,923
Los Angeles	11,539,589	1,505,088	5,367,376	586,708
San Francisco	422,395	64,200	201,900	21,368
Colorado	22,400	3,625	.....	.....
Totals	112,311,858	$17,366,813	79,983,957	$8,928,700

*Crude rubber including latex dry rubber content.